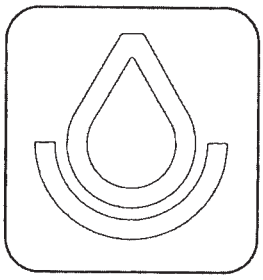
SOIL SURVEY

Charlotte County Virginia



UNITED STATES DEPARMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
Issued July 1974

Major fieldwork for this soil survey was done in the period 1963–68. Soil names and descriptions were approved in 1970. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1970. This survey was made cooperatively by the Soil Conservation Service and the Virginia Polytechnic Institute and State University. It is part of the technical assistance furnished to the Southside Soil and Water Conservation District.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, United States Department of Agriculture, Washington, D.C. 20250.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Charlotte County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and gives the capability classification of each. It also shows the page where each soil is described and the woodland group in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the test. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the capability units and woodland suitability groups.

Foresters and others can refer to the section "Use of the Soils as Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Soil Interpretations for Wildlife Habitat."

Community planners and others can read about soil properties that affect the choice of sites for nonindustrial buildings and for recreation areas in the section "Use of the Soils for Community Development and Recreation."

Engineers and builders can find, under "Engineering Uses of the Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation, Morphology, and Classification of the Soils."

Newcomers in Charlotte County may be especially interested in the section "General Soil Map," where broad patterns of soil are described. They may also be interested in the information about the county given at the beginning of the publication and in the section "General Nature of the County".

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Issued July 1974

SOIL SURVEY OF CHARLOTTE COUNTY, VIRGINIA

BY JOHN W. VAN DINE AND WILLIAM F. SLEDJESKI, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

CHARLOTTE COUNTY lies in the Piedmont Plateau section in the south-central part of Virginia (fig. 1). The county is bounded on the southwest by the Roanoke (also called Staunton) River, on the west by Campbell County, on the north by Appomattox and Prince Edward Counties, and on the east by Lunenburg and Mecklenburg Counties. It has an area of 298,880 acres. From east to west, the county is crossed by State Highway No. 40 and from north to south by U.S. Highway No. 360 and No. 15. The population in 1970 was 12,366. Charlotte Court House is the county seat. The largest towns are Keysville and Drakes Branch; they are about equal in population.

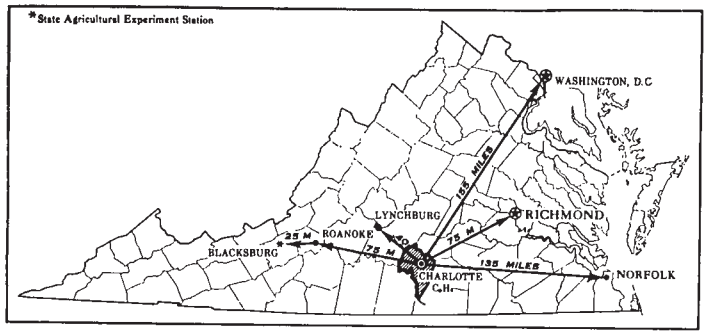

Figure 1.—Location of Charlotte County in Virginia.

Farming is the main occupation, and tobacco is the main cash crop, but livestock farming and dairying have increased in recent years. About 71 percent of the county is woodland, and the sale of forest products is an important source of income. Most of the soils are undulating to rolling. For the most part, they are low in natural fertility, and erosion is the major hazard in farming most soils in the county. The major manufacturing industry is textile production. Factories at Keysville produce textile yarns, carpets, and rugs. A factory at Drakes Branch produces fabrics.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Charlotte County, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes, the size and speed of streams, the kinds of native plants or crops, the kinds of rock, and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Cecil and Appling, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series in divided into phases. The name of a soil phase indicates a feature that affects management. For example, Cecil clay loam, 2 to 6 percent slopes, severely eroded, is one of several phases within the Cecil series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map in the back of this publication was prepared from the aerial photographs. The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to shown on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. Two such kinds of mapping units shown on the soil map of Char-

lotte County are soil complexes and undifferentiated groups.

A soil complex consists of areas of two or more soils, so intermingled or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. The name of a soil complex consists of the names of the dominant soils, joined by a hyphen. An example is Wehadkee-Chewacla complex.

An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils, or of two or more. The name of an undifferentiated group consists of the names of the dominant soils, joined by "and." Louisa and Louisburg soils, 15 to 25 percent slopes, severely eroded, is an example.

In most areas surveyed there are places where the soil material is so rocky, so shallow, or so severely eroded that it cannot be classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Alluvial land is a land type in Charlotte County.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soil in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way as to be readily useful to different groups of users, among them farmers, managers of woodland and rangeland, and engineers.

On the basis of yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others, then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Charlotte County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field, or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

Because of technical changes in the naming, mapping, and classification of soils, delineations on the general soil map of Charlotte County do not join those for the published general soil maps of Prince Edward and Mecklenburg Counties. The seven soil associations in Charlotte County are discussed in the following pages.

1. *Cecil-Appling association*

Deep, well-drained, undulating to hilly soils that have a fine sandy loam or clay loam surface layer

Most of this association is in the western part of the county. A small tract is south of Keysville, adjacent to Lunenburg County.

Cecil soils make up about 35 percent of the association, Appling soils 20 percent, and minor soils 45 percent. The association occupies about 64 percent of the county.

Cecil and Appling soils are mainly on the sides and broad tops of ridges. In most places they occupy areas adjacent to each other. In some places, however, they are adjacent to areas of minor soils in the association. Generally, the surface layer of Cecil and Appling soils is fine sandy loam, but in severely eroded areas it is clay loam. A few coarse fragments commonly are scattered throughout the soils of both series.

The minor soils of this association are mainly the Chewacla, Louisburg, Masada, Vance, Wehadkee, and Wilkes. The Chewacla and Wehadkee soils are on bottom land. They are poorly drained or somewhat poorly drained and are subject to flooding. The steep soils are mostly the Louisburg and Wilkes. These soils are shallow to moderately deep and excessively drained to well drained. The part of this association near Keysville has many areas of Vance soils. Even though they are well drained, the Vance soils are more slowly permeable than Cecil or Appling soils. A small area near Red House has a high proportion of Masada soils, which formed in old colluvial material and are deep, well drained, and gently sloping or sloping.

Cleared areas of this association are used mostly for general farming and tobacco. Livestock is raised on most farms. The gently sloping and sloping soils are suited to row crops. The strongly sloping and severely eroded soils are better suited to hay crops and pasture. Extensive areas of the steeper soils adjacent to the major streams are in trees, to which they are well suited. About 45 percent of this association is wooded.

2. *Georgeville-Herndon association*

Deep, well-drained, undulating to hilly soils that have a silt loam or silty clay loam surface layer

This association is in the eastern part of the county. Georgeville soils make up about 50 percent of the associa-

tion, Herndon soils 30 percent, and minor soils 20 percent. The association occupies about 17 percent of the county.

Georgeville and Herndon soils are mainly on the sides and broad tops of ridges. These soils commonly occupy areas adjacent to each other. In some places, however, they are adjacent to areas of minor soils of the association. Generally, the surface layer is silt loam, but where severely eroded, both Georgeville and Herndon soils have a silty clay loam surface layer that contains a few coarse fragments.

The minor soils of the association are mainly the Chewacla, Goldston, Orange, and Wehadkee. The Chewacla and Wehadkee soils are on bottom land. They are poorly drained to somewhat poorly drained and are subject to flooding. The Goldston soils are hilly. They are excessively drained to well drained and moderately deep over bedrock. The gently sloping soils are mostly of the Orange series. They are somewhat poorly drained to moderately well drained.

Cleared areas of this association are used mostly for general farming and tobacco. Livestock is raised on most farms. The gently sloping and sloping soils are suited to row crops. The strongly sloping soils and those that are severely eroded are better suited to forage crops and pasture. Extensive areas of the steeper soils adjacent to major streams are in trees and are well suited to this use. About 50 percent of this association is wooded.

3. *Cullen-Madison association*

Deep, well-drained, undulating to hilly soils that have a loam, fine sandy loam, or clay loam surface layer and contain few to many fine mica flakes

This association is in the north-central part of the county. Cullen soils make up about 45 percent of the association, Madison soils 30 percent, and minor soils 25 percent. This association occupies about 5 percent of the county.

Cullen and Madison soils are mainly on the sides and broad tops of ridges. In most places they occupy areas adjacent to each other. In some places, however, they are adjacent to areas of minor soils in the association. Generally, the surface layer is loam in Cullen soils and fine sandy loam in Madison soils. Where they are severely eroded, soils of both series have a clay loam surface layer. The Cullen soils are slightly darker than the Madison soils throughout the profile. Madison soils contain more fine mica flakes in the lower part of the profile than the Cullen soils.

The minor soils of this association are mainly the Wehadkee, Chewacla, Louisa, and Wilkes. The Wehadkee and Chewacla soils are on bottom land. They are poorly drained or somewhat poorly drained and are subject to flooding. The steep Louisa and Wilkes soils are on side slopes adjacent to major streams. They are shallow to moderately deep and are excessively drained to well drained.

Cleared areas of this association are used mostly for general farming, and livestock is raised on most farms. The gently sloping and sloping soils are suited to row crops, but the strongly sloping soils and those that are severely eroded are better suited to hay crops and pasture. Many areas of the steeper soils adjacent to the major streams are in trees and are well suited to this use. About 35 percent of the association is wooded.

4. *Appling-Vance-Cecil association*

Deep, well-drained, undulating to rolling soils that have a fine gravelly sandy loam surface layer

This association is mainly in the southern part of the county near Wylliesburg and Red Oak, but one small area is in the northeastern part. Appling soils make up about 55 percent of the association, Vance soils 15 percent, Cecil soils 15 percent, and minor soils 15 percent. This association occupies about 7 percent of the county.

Appling and Vance soils are mainly on broad ridges and side slopes, and undulating Cecil soils are mostly on ridges. In most places these soils occupy areas adjacent to each other. In some places, however, they are adjacent to areas of minor soils of the association. In the area near Wylliesburg and Red Oak, nearly all the soils have a surface layer of fine gravelly sandy loam. In the small area in the northeastern part of the county, the surface layer is dominantly fine sandy loam. The Appling and Cecil soils have moderate permeability, and the Vance soils have slow permeability.

Minor soils of this association are mainly the Chewacla, Helena, and Wehadkee. The Wehadkee and Chewacla soils are on bottom land; they are poorly drained or somewhat poorly drained and are subject to flooding. The Helena soils are on broad ridges; they are moderately well drained, have slow permeability, and are mottled throughout their subsoil.

Cleared areas of this association are used mostly for general farming and for growing tobacco. Livestock is raised on most farms. The gently sloping and sloping soils are suited to row crops, but the strongly sloping to moderately steep soils are better suited to hay crops and pasture. Many areas of the steeper soils near major streams are wooded. About 50 percent of the association is wooded.

5. *Chewacla-Congaree-Turbeville association*

Deep, well-drained to somewhat poorly drained, nearly level to steep soils that have a silt loam, fine sandy loam, or clay loam surface layer

This association is adjacent to the Roanoke (Staunton) River on the bottom land and adjoining terraces. Chewacla soils make up about 40 percent of the association, Congaree soils 15 percent, Turbeville soils 40 percent, and minor soils 5 percent. The association occupies about 3 percent of the county.

Chewacla and Congaree soils are on bottom land and are subject to flooding. Chewacla soils are somewhat poorly drained and occupy the lower bottom-land positions and old channels. Congaree soils are well drained and lie mainly in areas adjoining the Roanoke River channel. In most places these soils occupy areas adjacent to each other. The Turbeville soils are on the high terraces adjoining the bottom land. They are well drained and gently sloping to steep.

The minor soils of this association are mainly the Wehadkee and Masada. Wehadkee soils are in low areas and in old channels of the bottom land. They are poorly drained. The Masada soils are on high terraces and generally are adjacent to Turbeville soils.

Cleared areas of this association are used mostly for general farming, and some livestock is raised on most

farms. The soils on bottom land and the gently sloping soils on terraces are well suited to row crops. The strongly sloping to steep soils and areas of the severely eroded soils are better suited to forage crops and pasture. Extensive areas of the steep soils adjoining the bottom land are wooded. About 30 percent of the association is wooded.

There is potential for recreational development in this association because it is adjacent to the Roanoke (Staunton) River and is near the Kerr Reservoir (locally called Buggs Island Lake).

6. *Creedmoor-Mayodan-Pinkston association*

Deep to moderately deep, moderately well drained to excessively drained, undulating to hilly soils that have a sandy loam or fine sandy loam surface layer

This association is in the central part of the county along Roanoke Creek. Creedmoor soils make up about 35 percent of the association, Mayodan soils 35 percent, Pinkston soils 20 percent, and minor soils 10 percent. The association occupies about 1 percent of the county.

Creedmoor soils are on broad ridges and side slopes. They are moderately well drained and have slow permeability. The undulating Mayodan soils are on the tops and sides of ridges. They are well drained and generally occupy areas adjacent to Creedmoor soils. The Pinkston soils are mostly hilly and are excessively drained to well drained. They are in areas adjacent to the Roanoke Creek bottoms and commonly adjoin Creedmoor and Mayodan soils.

The minor soils of the association are mostly of the Wehadkee series. They are on bottom land along Roanoke Creek and are poorly drained and subject to flooding. Other soils of lesser extent are the Appling and Cecil soils.

Cleared areas of this association are used mostly for general farming, and some livestock is raised on most farms. The gently sloping Creedmoor and Mayodan soils are suited to row crops. Pinkston soils are mostly hilly and are better suited to forage crops, pasture, or trees. Extensive areas of soils on the bottoms and of hilly soils on uplands are wooded. About 60 percent of the association is wooded.

7. *Iredell-Vance-Helena association*

Moderately deep to deep, moderately well drained to well drained, undulating to rolling soils that have a loam or fine sandy loam surface layer

This association is in three separate parts of the county. The most extensive part is near Saxe, another area is at the southern tip of the county, and the other area is in the northern part, near Madisonville. Iredell soils make up about 35 percent of the association, Vance soils 30 percent, Helena soils 30 percent, and minor soils 5 percent. This association occupies about 3 percent of the county.

The major soils are mainly gently sloping to sloping and are on the tops and sides of ridges. Iredell soils are moderately deep to deep and are moderately well drained. They have a plastic, very firm subsoil. Vance soils are deep and well drained. Helena soils are deep and are moderately well drained. In most places Vance and Helena soils occupy areas adjacent to each other, but in some places they are adjacent to minor soils of the association.

The minor soils of the association are mainly the Mecklenburg and Wilkes. Mecklenburg soils are well drained and have a plastic, firm subsoil. The steeper soils near major drainageways are of the Wilkes series. They are well drained and moderately deep.

Cleared areas of this association are used mostly for general farming, and livestock is raised on most farms. Vance soils are suited to row crops. Iredell and Helena soils are better suited to forage crops and pasture. About 60 percent of the association is wooded.

Descriptions of the Soils

This section describes the soil series and mapping units in Charlotte County. Each soil series is described in considerable detail, and then, briefly, each mapping unit in that series. Unless it is specifically mentioned otherwise, it is to be assumed that what is stated about the soil series holds true for the mapping units in that series. Thus, to get full information about any one mapping unit, it is necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

An important part of the description of each soil series is the soil profile, that is, the sequence of layers from the surface downward to rock or other underlying material. Each series contains two descriptions of this profile. The first is brief and in terms familiar to the layman. The second, detailed and in technical terms, is for scientists, engineers, and others who need to make thorough and precise studies of soils. Unless otherwise stated, the colors given in the descriptions are those of a moist soil.

As mentioned in the section "How This Survey Was Made," not all mapping units are members of a soil series. Alluvial land, for example, does not belong to a soil series, but nevertheless, it is listed in alphabetic order along with the soil series.

Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit is the capability unit and the woodland suitability group in which the mapping unit has been placed. The page for the description of each capability unit can be found by referring to the "Guide to Mapping Units" at the back of this survey.

The acreage and proportionate extent of each mapping unit are shown in table 1. Many of the terms used in describing soils can be found in the Glossary at the end of this survey, and more detailed information about the terminology and methods of soil mapping can be obtained from the "Soil Survey Manual" (*8*).[1]

A given soil series in this county may be identified by a different name in a recently published soil survey of an adjacent county. Such differences in name result from changes in the concepts of soil classification that have occurred since publication. The characteristics of the soil series described in this county are considered to be within the range defined for that series. In those instances where a soil series has one or more features outside the defined range, the differences are explained.

[1] Italic numbers in parentheses refer to Literature Cited, p. 95.

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Area	Extent	Soil	Area	Extent
	Acres	*Percent*		*Acres*	*Percent*
Abell soils, 2 to 6 percent slopes	1, 198	0. 4	Cullen loam, 6 to 15 percent slopes, eroded	2, 287	. 8
Alluvial land	672	. 2	Cullen loam, 15 to 25 percent slopes, eroded	462	. 2
Altavista fine sandy loam, 0 to 2 percent slopes	264	. 1	Enon clay loam, 4 to 12 percent slopes, severely eroded	547	. 2
Altavista fine sandy loam, 2 to 6 percent slopes	1, 565	. 5	Enon fine sandy loam, 2 to 6 percent slopes, eroded	2, 304	. 8
Altavista fine sandy loam, 6 to 10 percent slopes, eroded	290	. 1	Enon fine sandy loam, 6 to 10 percent slopes, eroded	1, 908	. 6
Appling clay loam, 4 to 10 percent slopes, severely eroded	1, 095	. 4	Georgeville silt loam, 2 to 6 percent slopes, eroded	10, 527	3. 5
Appling clay loam, 10 to 20 percent slopes, severely eroded	1, 454	. 5	Georgeville silt loam, 6 to 15 percent slopes, eroded	5, 892	2. 0
Appling fine gravelly sandy loam, 2 to 6 percent slopes, eroded	3, 863	1. 3	Georgeville silt loam, 15 to 25 percent slopes, eroded	965	. 3
Appling fine gravelly sandy loam, 6 to 15 percent slopes, eroded	8, 197	2. 7	Georgeville silty clay loam, 2 to 6 percent slopes, severely eroded	4, 520	1. 5
Appling fine gravelly sandy loam, 15 to 25 percent slopes, eroded	536	. 2	Georgeville silty clay loam, 6 to 15 percent slopes, severely eroded	4, 580	1. 5
Appling fine sandy loam, 2 to 6 percent slopes, eroded	13, 081	4. 4	Goldston silt loam, 4 to 10 percent slopes	1, 652	. 5
Appling fine sandy loam, 6 to 10 percent slopes	1, 124	. 4	Goldston silt loam, 10 to 15 percent slopes	2, 895	1. 0
Appling fine sandy loam, 6 to 15 percent slopes, eroded	18, 079	6. 0	Goldston silt loam, 15 to 35 percent slopes	2, 611	. 9
Appling fine sandy loam, 15 to 25 percent slopes, eroded	939	. 3	Grover sandy loam, 2 to 6 percent slopes, eroded	304	. 1
Appling fine sandy loam, very deep, 2 to 6 percent slopes, eroded	2, 941	1. 0	Grover sandy loam, 6 to 15 percent slopes, eroded	687	. 2
Appling fine sandy loam, very deep, 6 to 15 percent slopes, eroded	3, 579	1. 2	Gullied land-Cecil complex, moderately steep	1, 799	. 6
Augusta fine sandy loam, 0 to 2 percent slopes	878	. 3	Helena fine gravelly sandy loam, 2 to 6 percent slopes	424	. 1
Augusta fine sandy loam, 2 to 6 percent slopes	651	. 2	Helena fine gravelly sandy loam, 6 to 10 percent slopes, eroded	226	. 1
Buncombe loamy sand	420	. 1	Helena fine sandy loam, 2 to 6 percent slopes, eroded	2, 076	. 7
Buncombe-Toccoa complex	966	. 3	Helena fine sandy loam, 6 to 10 percent slopes, eroded	1, 166	. 4
Cecil clay loam, 2 to 6 percent slopes, severely eroded	4, 276	1. 4	Herndon silt loam, 2 to 6 percent slopes, eroded	5, 502	1. 8
Cecil clay loam, 6 to 15 percent slopes, severely eroded	17, 286	5. 8	Herndon silt loam, 6 to 15 percent slopes, eroded	8, 572	2. 9
Cecil clay loam, 15 to 25 percent slopes, severely eroded	722	. 2	Herndon silty clay loam, 2 to 6 percent slopes, severely eroded	239	. 1
Cecil clay loam, very deep, 2 to 6 percent slopes, severely eroded	488	. 2	Herndon silty clay loam, 6 to 15 percent slopes, severely eroded	1, 239	. 4
Cecil clay loam, very deep, 6 to 15 percent slopes, severely eroded	965	. 3	Iredell loam, 2 to 6 percent slopes	1, 091	. 4
Cecil fine gravelly sandy loam, 2 to 6 percent slopes, eroded	1, 364	. 5	Iredell loam, 2 to 6 percent slopes, eroded	1, 517	. 5
Cecil fine gravelly sandy loam, 6 to 15 percent slopes, eroded	925	. 3	Iredell loam, 6 to 10 percent slopes, eroded	1, 304	. 4
Cecil fine gravelly sandy loam, 15 to 25 percent slopes, eroded	218	. 1	Louisa fine sandy loam, 6 to 15 percent slopes	442	. 2
Cecil fine sandy loam, 2 to 6 percent slopes, eroded	20, 095	6. 7	Louisa fine sandy loam, 15 to 35 percent slopes	1, 065	. 4
Cecil fine sandy loam, 6 to 15 percent slopes, eroded	15, 612	5. 2	Louisa and Louisburg soils, 15 to 25 percent slopes, severely eroded	656	. 2
Cecil fine sandy loam, 15 to 25 percent slopes, eroded	1, 114	. 4	Louisburg sandy loam, 4 to 10 percent slopes	1, 123	. 4
Cecil fine sandy loam, very deep, 2 to 6 percent slopes, eroded	3, 653	1. 2	Louisburg sandy loam, 10 to 15 percent slopes	2, 186	. 7
Cecil fine sandy loam, very deep, 6 to 15 percent slopes, eroded	2, 870	1. 0	Louisburg sandy loam, 15 to 35 percent slopes	2, 890	1. 0
Cecil fine sandy loam, very deep, 15 to 25 percent slopes, eroded	219	. 1	Madison clay loam, 2 to 6 percent slopes, severely eroded	867	. 3
Chewacla silt loam	4, 205	1. 4	Madison clay loam, 6 to 15 percent slopes, severely eroded	2, 204	. 7
Colfax fine sandy loam, 2 to 6 percent slopes	575	. 2	Madison fine sandy loam, 2 to 6 percent slopes, eroded	1, 872	. 6
Congaree silt loam	1, 362	. 5	Madison fine sandy loam, 6 to 15 percent slopes, eroded	1, 671	. 6
Creedmoor sandy loam, 2 to 6 percent slopes, eroded	681	. 2	Madison and Grover fine sandy loams, 15 to 25 percent slopes, eroded	441	. 2
Creedmoor sandy loam, 6 to 10 percent slopes, eroded	379	. 1	Masada fine sandy loam, 2 to 6 percent slopes, eroded	1, 343	. 4
Cullen clay loam, 2 to 6 percent slopes, severely eroded	1, 163	. 4	Masada fine sandy loam, 6 to 15 percent slopes, eroded	1, 570	. 5
Cullen clay loam, 6 to 15 percent slopes, severely eroded	2, 352	. 8	Masada fine sandy loam, 15 to 25 percent slopes	668	. 2
Cullen loam, 2 to 6 percent slopes, eroded	3, 440	. 2	Mayodan sandy loam, 2 to 6 percent slopes, eroded	521	. 2

TABLE 1.—*Approximate acreage and proportionate extent of the soils*—Continued

Soil	Area	Extent
	Acres	*Percent*
Mayodan sandy loam, 6 to 15 percent slopes, eroded	501	.2
Mecklenburg loam, 2 to 6 percent slopes, eroded	376	.1
Mecklenburg loam, 6 to 12 percent slopes, eroded	562	.2
Mecklenburg loam, loamy subsoil variant, 2 to 6 percent slopes	359	.1
Mecklenburg loam, loamy subsoil variant, 6 to 10 percent slopes	585	.2
Mecklenburg loam, loamy subsoil variant, 10 to 25 percent slopes	609	.2
Mecklenburg loam, loamy subsoil variant, 10 to 25 percent slopes, severely eroded	362	.1
Orange silt loam, 2 to 6 percent slopes	864	.3
Orange silt loam, 2 to 6 percent slopes, eroded	4, 246	1.4
Orange silt loam, 6 to 10 percent slopes, eroded	976	.3
Pacolet clay loam, 4 to 10 percent slopes, severely eroded	344	.1
Pacolet clay loam, 10 to 15 percent slopes, severely eroded	449	.2
Pacolet fine sandy loam, 2 to 6 percent slopes, eroded	375	.1
Pacolet fine sandy loam, 6 to 15 percent slopes, eroded	1, 170	.4
Pacolet fine sandy loam, 15 to 25 percent slopes, eroded	1, 192	.4
Pinkston fine sandy loam, 6 to 10 percent slopes	227	.1
Pinkston fine sandy loam, 10 to 25 percent slopes	423	.1
Roanoke silt loam	1, 256	.4
Starr loam, 2 to 6 percent slopes	647	.2
State silt loam, 2 to 6 percent slopes	283	.1
Toccoa fine sandy loam	282	.1
Turbeville clay loam, 2 to 6 percent slopes, severely eroded	258	.1
Turbeville clay loam, 6 to 15 percent slopes, severely eroded	754	.2
Turbeville fine sandy loam, 2 to 6 percent slopes, eroded	1, 505	.5
Turbeville fine sandy loam, 6 to 15 percent slopes, eroded	1, 101	.4
Turbeville fine sandy loam, 15 to 35 percent slopes, eroded	677	.2
Vance fine gravelly sandy loam, 2 to 6 percent slopes, eroded	1, 097	.4
Vance fine gravelly sandy loam, 6 to 15 percent slopes, eroded	1, 195	.4
Vance fine sandy loam, 2 to 6 percent slopes, eroded	1, 564	.5
Vance fine sandy loam, 6 to 10 percent slopes, eroded	1, 073	.4
Vance fine sandy loam, 10 to 15 percent slopes, eroded	458	.2
Wedowee fine sandy loam, 2 to 6 percent slopes, eroded	335	.1
Wedowee fine sandy loam, 6 to 15 percent slopes, eroded	1, 183	.4
Wehadkee-Chewacla complex	14, 521	4.9
Wehadkee fine sandy loam, overwash	2, 307	.8
Wehadkee silt loam	1, 579	.5
Wickham fine sandy loam, 2 to 6 percent slopes	499	.2
Wickham fine sandy loam, 6 to 10 percent slopes, eroded	152	.1
Wilkes fine sandy loam, 2 to 6 percent slopes	841	.3
Wilkes fine sandy loam, 6 to 15 percent slopes	5, 873	2.0
Wilkes fine sandy loam, 15 to 35 percent slopes	6, 987	2.3
Wilkes soils, 4 to 10 percent slopes, severely eroded	712	.2
Wilkes soils, 10 to 35 percent slopes, severely eroded	2, 917	1.0
Worsham soils	2, 240	.7
Worsham soils, fragipan variant	393	.1
Total	298, 880	100.0

Abell Series

The Abell series consists of deep, moderately well drained to well drained, gently sloping soils on uplands. These soils are in shallow depressions, on foot slopes, and along intermittent drainageways. They formed in locally deposited material washed from higher lying soils.

In a representative profile, the surface layer is dark-brown fine sandy loam about 8 inches thick. The subsoil is about 47 inches thick. The upper part of the subsoil is strong-brown fine sandy loam; the middle part is yellowish-brown fine sandy clay loam over yellowish-brown clay loam; and the lower part is mottled strong-brown, grayish-brown, and black silty clay loam over mottled strong-brown, yellowish-brown, and grayish-brown silty clay.

Abell soils have a strongly acid or very strongly acid subsoil and are medium in natural fertility. They have moderate to moderately rapid permeability and medium available water capacity. They are subject to occasional overflow from surface runoff from higher adjacent areas.

Representative profile of an Abell fine sandy loam from an area of Abell soils, 2 to 6 percent slopes, in a pasture on the north side of State Highway No. 604, one-fourth mile west of the junction of that highway with State Highway No. 656:

Ap—0 to 8 inches, dark-brown (7.5YR 4/4) fine sandy loam; weak, fine, granular structure; friable; strongly acid; clear, smooth boundary.

B1—8 to 18 inches, strong-brown (7.5YR 5/6) heavy fine sandy loam; weak, fine, granular structure and weak, fine, subangular blocky structure; soft, friable, slightly sticky; patches and spots of dark organic material; 5 percent, by volume, angular quartz gravel; very strongly acid; gradual, smooth boundary.

B21t—18 to 26 inches, yellowish-brown (10YR 5/6) light fine sandy clay loam; weak, fine, subangular blocky structure; soft to slightly hard, friable, slightly sticky and slightly plastic; few fine and medium roots; few fine and medium pores; few thin patchy clay films; 3 to 5 percent, by volume, angular quartz gravel; very strongly acid; gradual, smooth boundary.

B22t—26 to 40 inches, yellowish-brown (10YR 5/6) light clay loam; small spots of red (2.5YR 5/8); weak, fine, subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; few fine and medium pores; few thin patchy clay films; 5 to 10 percent, by volume, angular quartz gravel; very strongly acid; gradual, smooth boundary.

IIB23t—40 to 45 inches, mottled strong-brown (7.5YR 5/6), grayish-brown (10YR 5/2), and black (10YR 2/1) silty clay loam; weak, medium, subangular blocky structure; hard, firm, sticky and plastic; few patchy clay films; common soft manganese concretions; very strongly acid; gradual, smooth boundary.

IIB24t—45 to 55 inches, mottled strong-brown (7.5YR 5/6), yellowish-brown (10YR 5/6), and grayish-brown (2.5Y 5/2) silty clay; weak, medium, subangular blocky

structure; hard, firm, sticky and plastic; few thick clay films; very strongly acid.

Texture of the A horizon is normally fine sandy loam or sandy loam, but it ranges to loam. The Ap horizon has a hue of 10YR or 7.5YR, a value of 4 or 5, and a chroma of 4 to 8. In areas that have not been cultivated, the profile contains an A1 horizon, ½ inch to 3 inches thick, that is very dark grayish brown or dark grayish brown and has a hue of 10YR, a value of 3 or 4, and a chroma of 2. The B2t horizon has a hue of 5YR to 10YR; value is 4 to 6 and chroma is 6 to 8. Texture of the B2t horizon ranges from sandy clay loam to clay loam, and the content of clay ranges from 18 to 35 percent. In some places low-chroma mottles are missing in the upper 24 inches of the Bt horizon. In many places the IIB2t horizon has an appreciably coarser or finer texture than the B2t horizon; texture of the IIB2t horizon ranges from sandy clay loam to silty clay. A thin stone line lies between the B2t and IIB2t horizons in some places. Depth to the IIB2t horizon, which developed in unconforming material, ranges from 36 to 48 inches but generally is about 40 inches. Depth to bedrock ranges from 4 to 8 feet. The content of coarse fragments in the profile ranges from 3 to 10 percent, by volume. Reaction is strongly acid or very strongly acid.

Abell soils are similar to Altavista, Colfax, and State soils. In contrast to the Altavista and Colfax soils, however, they have a IIBt horizon, and they lack the fragipan that is typical of the Colfax soils. Abell soils have a thicker Bt horizon than State soils. Also unlike the State soils, they have a Bt horizon that extends into the unconforming material.

In many places Abell soils occur near the Appling, Cecil, and Louisburg soils. They have a less clayey subsoil than Appling and Cecil soils, and a less reddish subsoil than the Cecil soils. Abell soils have a thicker subsoil and a higher content of clay in the subsoil than the Louisburg soils.

Abell soils, 2 to 6 percent slopes (AbB).—These soils are at the heads of drainageways and on foot slopes or alluvial fans. They are the only soils of the Abell series mapped in Charlotte County. Their surface layer is fine sandy loam, sandy loam, or loam.

Included with these soils in mapping were small areas of Worsham soils.

Most of the acreage is used for cultivated crops, pasture, and gardens, but many areas are wooded. These soils are well suited to most of the commonly grown crops. They are only fairly well suited to alfalfa. Capability unit IIe–3; woodland suitability group 1.

Alluvial Land

Alluvial land (Ad) is a well drained or moderately well drained land type consisting of sediment washed from adjoining soils of uplands. It occurs in drainageways and depressions and on flood plains throughout the county. Flooding takes place occasionally, and seepage water is also received from the adjacent, higher lying areas. From time to time, fresh soil material is added as the result of overwash and deposition.

The sediment is 24 inches or more thick, is commonly grayish brown to light yellowish brown, and has a texture of fine sandy loam in most places. Its characteristics are related to the kind of soil from which the sediment was derived. In most areas where this land type is light colored and has a texture of fine sandy loam, for example, the sediment was derived mostly from Cecil and Appling soils. In other areas, where the sediment is dark brown or reddish brown and has a texture of loam or clay loam, the sediment was derived mainly from Cullen soils or from severely eroded Cecil and Georgeville soils. No structural development has taken place.

Natural fertility is low to medium, and the content of organic matter is low. Available water capacity is medium, and permeability is moderate to rapid.

This land type is well suited to most of the commonly grown field crops, grasses, and legumes, but it is not well suited to alfalfa. It is used mainly for cultivated crops and pasture, but some areas near homes are commonly used for gardens. Wetness and deposition caused by occasional overflow and seepage are the major limitations to use of this land type for crops. Limitations are severe to use of the land for nonfarm purposes. Capability unit IIw–1; woodland suitability group 1.

Altavista Series

The Altavista series consists of deep, moderately well drained, nearly level to sloping soils on terraces and colluvial fans. These soils formed in sediment washed from soils of uplands underlain by igneous and metamorphic rocks. They occupy areas adjacent to bottom lands along the major streams. The nearly level soils are subject to occasional flooding of short duration. Flooding is less frequent on the sloping soils.

In a representative profile, the surface layer is light olive-brown fine sandy loam about 7 inches thick. The subsurface layer is brownish-yellow fine sandy loam about 4 inches thick. The subsoil is about 31 inches thick. It is pale-brown sandy clay loam in the upper part; brownish-yellow light clay loam mottled with red in the middle part; and light yellowish-brown light clay loam mottled with yellowish red, light brownish gray, and gray in the lower part. The substratum is gray light clay loam mottled with yellowish brown. It contains a few pebbles and a few mica flakes. Depth to hard rock is more than 5 feet.

Altavista soils are medium acid to strongly acid. Natural fertility is low to medium. The available water capacity is high, and permeability is moderate.

The Altavista soils are used mostly for cultivated crops and pasture.

Representative profile of Altavista fine sandy loam, 2 to 6 percent slopes, in a field that was formerly cultivated but that is now in pine, one-fourth mile west of Cub Creek along State Highway No. 619:

Ap—0 to 7 inches, light olive-brown (2.5Y 5/4) fine sandy loam; weak, fine, granular structure; very friable; few fine pebbles; many fine roots; medium acid; clear, smooth boundary.

A2—7 to 11 inches, brownish-yellow (10YR 6/6) fine sandy loam; weak, fine, granular structure; very friable; few fine pebbles; many fine roots; medium acid; clear, wavy boundary.

B21t—11 to 24 inches, pale-brown (10YR 6/3) sandy clay loam; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; few fine pebbles; few medium roots; few thin clay films; medium acid; clear, wavy boundary.

B22t—24 to 29 inches, brownish-yellow (10YR 6/6) light clay loam; common, medium, prominent, red (2.5YR 4/8) mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; few fine pebbles; few fine mica flakes; common thin clay films; strongly acid; clear, wavy boundary.

B23t—29 to 38 inches, light yellowish-brown (2.5Y 6/4) light clay loam; common, fine, distinct, yellowish-red (5YR 5/8), and light brownish-gray (2.5Y 6/2) mottles; moderate, medium, angular blocky structure; firm, sticky and plastic; common thin clay films; few fine

pebbles; few fine mica flakes; strongly acid; clear, wavy boundary.

B3t—38 to 42 inches, light yellowish-brown (2.5Y 6/4) light clay loam; many, medium, distinct, gray (10YR 6/1) mottles; weak, medium, angular blocky structure; friable; slightly sticky and slightly plastic, few thin clay films; fine pebbles; few fine mica flakes; strongly acid; clear, wavy boundary.

Cg—42 to 52 inches, gray (10YR 6/1) light clay loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; massive; few fine pebbles; few fine mica flakes; strongly acid.

The A and Bt horizons range from strong brown to light olive brown in color. Texture of the Bt horizon ranges from heavy loam to light silty clay loam. The C horizon is commonly stratified. Individual strata range from sand to clay and contain variable amounts of pebbles. The thickness of the solum ranges from 29 to 54 inches. Depth to hard rock is more than 5 feet. Reaction is medium acid or strongly acid throughout the profile.

Altavista soils are similar to the Augusta and Wickham soils. In the upper 24 inches of the Bt horizon, however, they have gray mottles that are lacking in the Wickham soils. Altavista soils lack the gray B2t horizon that is characteristic of the Augusta soils. In many places Altavista soils occur near Augusta, Masada, Wickham, and Roanoke soils. They are better drained and are less grayish than the Roanoke soils. Altavista soils have less clay in the subsoil and are less well drained than Masada soils.

Altavista fine sandy loam, 0 to 2 percent slopes (AfA).—This soil is on low stream terraces adjoining bottom lands. It has a profile similar to the one described as representative for the Altavista series, but it has gray mottles higher in the subsoil.

Included with this soil in mapping were small areas of somewhat poorly drained Augusta soils. Also included were small areas of soils that have a clayey subsoil and soils having a silt loam surface layer.

Occasionally, this soil is covered by overflow water from the nearby streams. The floodwaters remain for only short periods of time.

Most of the acreage is used for cultivated crops and pasture. A few areas are wooded, and some fields are planted to pines. If adequately drained and fertilized, this soil is well suited to most locally grown crops except alfalfa. Alfalfa can be grown, but it is generally not long lived, because of excessive wetness in winter and early in spring. Capability unit IIw–1; woodland suitability group 3.

Altavista fine sandy loam, 2 to 6 percent slopes (AfB).—This soil is on low terraces adjacent to the major streams. It has the profile described as representative for the series.

Included with this soil in mapping were small areas of soils that have a loam or silt loam surface layer. Also included were small areas of somewhat poorly drained Augusta soils.

This Altavista soil is moderately susceptible to erosion. Some of the lower lying areas are occasionally flooded for short periods.

Most of the acreage is used for cultivated crops and pasture, but some fields are planted to pines. If adequately drained and fertilized, this soil is well suited to most locally grown crops. Alfalfa can be grown, but it generally is not long lived, because of excessive wetness in winter and early in spring. Capability unit IIe–3; woodland suitability group 3.

Altavista fine sandy loam, 6 to 10 percent slopes, eroded (AfC2).—This soil is on terraces and colluvial fans adjacent to the major streams. Part of the original surface layer has been removed by erosion, and the soil is susceptible to further erosion. Otherwise, the profile is similar to the one described as representative for the Altavista series. Included with this soil in mapping were a few areas of soils that have a loam or silt loam surface layer. Also included were small areas of well-drained Wickham soils.

Most of the acreage is used for cultivated crops, hay, and pasture. If this soil is adequately limed and fertilized, it is well suited to most of the locally grown crops. Capability unit IIIe–1; woodland suitability group 3.

Appling Series

The Appling series consists of deep, well-drained soils that have a clayey layer in the subsoil. These are undulating to hilly soils on uplands. They formed in the weathered products of acid igneous and metamorphic rocks. These soils are very extensive in Charlotte County.

In a representative profile, the surface layer is light olive-brown fine sandy loam about 7 inches thick. The subsoil, which extends to a depth of about 56 inches, is mainly yellowish-red heavy clay loam and clay. The substratum is mottled red, yellowish-brown, and white clay loam.

Appling soils have a strongly acid to very strongly acid subsoil and are low in natural fertility. Permeability of the subsoil is moderate, and available water capacity is medium.

Representative profile of Appling fine sandy loam, 2 to 6 percent slopes, eroded, in an area of oak and pine, along State Highway No. 619, one-half mile west of junction of that highway with State Highway No. 649:

Ap—0 to 7 inches, light olive-brown (2.5Y 5/4) fine sandy loam; weak, fine, granular structure; very friable; many fine roots; few fine pebbles; strongly acid; clear boundary.

B1—7 to 9 inches, yellowish-brown (10YR 5/8) heavy fine sandy loam; weak, fine, subangular blocky structure; very friable, slightly sticky; many fine roots; few fine pebbles; strongly acid; clear, wavy boundary.

B21t—9 to 12 inches, yellowish-red (5YR 4/8) light clay loam; moderate, medium, subangular blocky structure; friable; thin discontinuous clay films; few medium roots; strongly acid; clear, wavy boundary.

B22t—12 to 21 inches, yellowish-red (5YR 4/8) heavy clay loam; many, medium, distinct, red (2.5YR 4/6) mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; few medium roots; thin discontinuous clay films; strongly acid; clear, wavy boundary.

B23t—21 to 40 inches, yellowish-red (5YR 4/6) clay; many, medium, distinct, red (2.5YR 4/8) and yellowish-brown (10YR 5/8) mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; thin discontinuous clay films; strongly acid; clear, wavy boundary.

B3t—40 to 56 inches, red (2.5YR 4/8) and yellowish-brown (10YR 5/6), mottled clay loam; weak, fine, subangular blocky structure; friable, sticky and slightly plastic; strongly acid; clear, irregular boundary.

C—56 to 72 inches, red (2.5YR 4/8), yellowish-brown (10YR 5/8), and white, mottled clay loam saprolite that shows original rock structure; strongly acid.

R—72 inches, acid schist and gneiss.

The Al horizon, if present, ranges from dark gray to grayish brown in color. The A2 horizon ranges from light yellowish brown to pale brown. Cultivated areas have an Ap horizon that is light olive brown or yellowish brown. Texture of the surface layer is dominantly fine sandy loam, but in severely eroded areas it is clay loam. The Bt horizon ranges from yel-

lowish red to yellowish brown. This horizon generally has mottles of high value and chroma. Its texture ranges from heavy clay loam to clay; content of clay ranges from 35 to about 55 percent. The C horizon is weathered gneiss, granite, or schist that is commonly mottled in shades of red, brown, yellow, and gray. The solum ranges from 40 to 60 inches in thickness. Thickness of the saprolite ranges from 2 to more than 50 feet. Texture of the C horizon ranges from sandy loam to clay loam. Depth to hard rock is more than 5 feet, and in places it is more than 50 feet. Reaction is strongly acid to very strongly acid, unless the soil is limed.

Appling soils are similar to the Cecil, Vance, and Wedowee soils. Their subsoil is yellower in hue or less red than that of Cecil soils. Appling soils have a less firm subsoil than Vance soils and a thicker solum than Wedowee soils.

Appling soils commonly occur near Cecil, Colfax, Louisburg, Vance, Wedowee, and Worsham soils. They differ from Colfax soils in having more clay in the subsoil and in lacking a fragipan in or below the subsoil. They have more clay in the subsoil than Louisburg soils and are deeper to bedrock. Appling soils are better drained than Worsham soils.

Appling fine gravelly sandy loam, 2 to 6 percent slopes, eroded (AgB2).—This gently sloping to undulating soil is on uplands. The surface layer is 20 to 30 percent fine gravel, and the subsoil is 5 to 20 percent fine gravel. Otherwise, the profile of this soil is similar to the one described as representative for the series. Most of the pebbles are less than one-half inch in diameter.

Included with this soil in mapping were small areas of Worsham soils that are in swales and depressions and a few small areas of Helena fine gravelly sandy loam at the base of slopes.

Runoff is slow to medium, and further erosion is a moderate hazard if this Appling soil is cultivated.

Most of the acreage is used for cultivated crops, hay, and pasture. This soil is especially well suited to tobacco, and if adequately limed and fertilized, it is well suited to most locally grown crops. Capability unit IIe–1; woodland suitability group 4.

Appling fine gravelly sandy loam, 6 to 15 percent slopes, eroded (AgD2).—This rolling soil is on uplands. It has a gravelly sandy loam surface layer that is 20 to 30 percent fine gravel and a subsoil that is 5 to 20 percent fine gravel. Otherwise, the profile is similar to the one described as representative for the series.

Included with this soil in mapping were a few small areas of severely eroded soils that have a yellowish-red gravelly clay loam surface layer. Also included were a few small areas of nearly level Abell soils at the heads of some drainageways.

Most of the acreage is wooded, and some fields are planted to pines. Cleared areas are used mostly for pasture and hay. This soil is very susceptible to further erosion if it is plowed. Capability unit IIIe–1; woodland suitability group 4.

Appling fine gravelly sandy loam, 15 to 25 percent slopes, eroded (AgE2).—This hilly soil is on uplands that are adjacent to streams and large drainageways. The surface layer is fine gravelly sandy loam that is 20 to 30 percent fine gravel, and the subsoil is 5 to 20 percent fine gravel. Otherwise, the profile is similar to the one described as representative for the series.

Included with this soil in mapping were a few small areas of the steeper Louisburg soils and a few small areas of severely eroded soils that have a yellowish-red gravelly clay loam surface layer.

Most of the acreage is wooded, and some fields are planted to pines. Cleared areas are used mostly for pasture. This soil is very susceptible to further erosion if it is plowed. Capability unit IVe–1; woodland suitability group 4.

Appling fine sandy loam, 2 to 6 percent slopes, eroded (AlB2).—This gently sloping to undulating soil is on uplands. It has the profile described as representative for the series. The surface layer is generally less than 8 inches thick, but the thickness ranges from 5 to 15 inches.

Included with this soil in mapping were small areas of poorly drained Worsham soils in swales and depressions and a few small areas of Colfax fine sandy loam at the base of slopes.

Runoff is slow to medium, and there is a moderate hazard of further erosion if the soil is cultivated.

Most of the acreage is used for cultivated crops, hay, and pasture. This soil is especially well suited to tobacco and, if adequately limed and fertilized, it is well suited to most locally grown crops. Capability unit IIe–1; woodland suitability group 4.

Appling fine sandy loam, 6 to 10 percent slopes (AlC).—This soil is on convex ridges and side slopes in the uplands. Except for having a thicker surface layer, its profile is similar to the one described as representative for the series. In most places the surface layer is more than 8 inches thick.

Included with this soil in mapping were a few small areas of Colfax fine sandy loam, 2 to 6 percent slopes, that are in depressions at the base of slopes and near intermittent drainageways.

Runoff is medium, and the soil is moderately susceptible to accelerated erosion if it is cultivated or cleared and left bare.

Much of the acreage is wooded. About half of the acreage is used for cultivated crops, pasture, and pine plantings. This soil is very well suited to tobacco, and if adequately limed and fertilized, it is well suited to most locally grown crops. Capability unit IIe–1; woodland suitability group 4.

Appling fine sandy loam, 6 to 15 percent slopes, eroded (AlD2).—This soil has convex and plane slopes. It is on upland ridges, side slopes, and the lower parts of some hillsides. In most places the surface layer is less than 8 inches thick, but the thickness ranges from about 5 to 9 inches.

Included with this soil in mapping were small areas of severely eroded soils that have a yellowish-red clay loam or sandy clay loam plow layer and few areas of Abell soils, 2 to 6 percent slopes, that occupy colluvial depressions adjacent to drainageways.

Runoff is medium to rapid, and this soil is highly susceptible to further erosion if it is used continuously for the production of clean-tilled crops. The surface layer is friable and easily tilled.

Most of this soil is wooded or has been planted to pines. Cleared areas are used for pasture, hay and cultivated crops. If adequately limed and fertilized, this soil is fairly well suited to locally grown crops. Tobacco is better suited to the less strongly sloping and less eroded areas. Capability unit IIIe–1; woodland suitability group 4.

Appling fine sandy loam, 15 to 25 percent slopes, eroded (AlE2).—This soil has plane and convex slopes. It is on uplands adjacent to streams and large drainageways. The surface layer is generally less than 8 inches thick, but the thickness ranges from about 5 to 9 inches.

Included with this soil in mapping were small areas of severely eroded soils that have a yellowish-red clay loam or sandy clay loam surface layer and some small areas of Louisburg soils that occupy some of the ridge crests and steeper side slopes.

Runoff is rapid, and fall-maturing crops are damaged because sufficient water is lacking, especially in the steeper areas. The surface layer is friable and easily tilled, but this soil is highly susceptible to further erosion if it is cultivated.

Most of the acreage is wooded or has been planted to pines. Cleared areas are used mostly for hay and pasture. This soil is poorly suited to cultivated crops but it is fairly well suited to hay and pasture. Capability unit IVe–1; woodland suitability group 4.

Appling fine sandy loam, very deep, 2 to 6 percent slopes, eroded (AmB2).—This gently sloping to undulating soil is on uplands. Its profile differs from the one described as representative for the series in that it has a higher content of silt and very fine sand and the depth to bedrock is more than 15 feet.

Included with this soil in mapping were a few small areas of Herndon silt loam, as well as some small areas of Worsham soils in swales and depressions.

Most of the acreage is used for cultivated crops, hay, and pasture. If this soil is properly managed, it is well suited to tobacco. Compared with most of the Appling soils, the cost of excavations is lower in this soil because the substratum is thick and friable. Capability unit IIe–1; woodland suitability group 4.

Appling fine sandy loam, very deep, 6 to 15 percent slopes, eroded (AmD2).—This rolling soil is on uplands. Its profile is similar to the one described as representative for the series, but depth to hard rock is more than 15 feet and the content of silt and very fine sand is higher.

Included with this soil in mapping were a few small areas of Herndon silt loam and of Abell soils, which are at the heads of some drainageways.

Most of this soil is wooded, and some fields are planted to pines. Cleared areas are used mostly for pasture and hay. This soil is very susceptible to erosion if it is plowed. Compared with most of the Appling soils, the cost of excavations is lower in this soil because the substratum is thick and friable. Capability unit IIIe–1; woodland suitability group 4.

Appling clay loam, 4 to 10 percent slopes, severely eroded (ApC3).—This soil is on convex ridges and side slopes of the uplands. Most of the original surface layer has been removed by erosion, and small gullies are common. In most places plowing has mixed the subsoil with remnants of the original fine sandy loam surface layer, and the plow layer is now yellowish-red clay loam or sandy clay loam. The profile of this soil is otherwise similar to the one described as representative for the series.

Included with this soil in mapping were small areas of Abell and Colfax soils that occupy colluvial positions adjacent to drainageways and small areas of less eroded soils that have a fine sandy loam surface layer.

Runoff is medium to rapid, and this soil is highly susceptible to further erosion unless it is properly managed. The surface layer is sticky when wet and hard when dry, and this makes tillage difficult and slows the infiltration of water.

Most of the acreage is used for hay and pasture. Some formerly cultivated fields are idle, and some have been planted to pines. This soil is poorly suited to cultivated crops but is fairly well suited to hay and pasture. Capability unit IVe–1; woodland suitability group 5.

Appling clay loam, 10 to 20 percent slopes, severely eroded (ApE3).—This soil has plane and convex slopes. It is on upland ridges, side slopes, and the lower parts of some hillsides. Most of the original surface layer has been removed by erosion, and small gullies are common. In most places plowing has mixed some of the subsoil with remnants of the original fine sandy loam surface layer, and the plow layer is now yellowish-red clay loam or sandy clay loam. The profile of this soil is otherwise similar to the one described as representative for the series.

Included with this soil in mapping were small areas of Louisburg soils that occupy some of the ridge crests and steeper side slopes.

Runoff is rapid, and the hazard of erosion is very severe. The surface layer is sticky when wet and hard when dry, and this makes tillage difficult and slows the infiltration of water. Enough water is lost through runoff to cause the soil to be droughty during dry periods.

Most of the acreage is used for pasture. Some formerly cultivated fields are idle, and some have been planted to pines. The soil is poorly suited to cultivated crops and is not commonly used for that purpose. It is fairly well suited to hay and pasture. Capability unit VIe-1; woodland suitability group 5.

Augusta Series

The Augusta series consists of deep, somewhat poorly drained soils. These nearly level to gently sloping soils formed on terraces in alluvial sediment that eroded from soils on uplands underlain by igneous and metamorphic rocks. Augusta soils are adjacent to major streams and low-lying areas. They are occasionally flooded for periods of short duration.

In a representative profile, the surface layer is grayish-brown fine sandy loam about 7 inches thick. The subsoil extends to a depth of 60 inches. The upper part of the subsoil is grayish-brown and yellowish-brown sandy clay loam to light clay loam mottled with gray, and the lower part is gray light clay mottled with yellowish brown. The substratum is gray gravelly clay loam.

Augusta soils have a medium acid to strongly acid subsoil and are low to medium in natural fertility. Permeability in the subsoil is moderate, and available water capacity is medium.

Representative profile of Augusta fine sandy loam, 2 to 6 percent slopes, on Roanoke Plantation, 1 mile northwest of Randolph on south side of State Highway No. 607:

Ap—0 to 7 inches, grayish-brown (10YR 5/2) fine sandy loam; weak, fine, granular structure; very friable; few fine roots; few fine pebbles; medium acid; abrupt, smooth boundary.

B21t—7 to 11 inches, grayish-brown (2.5Y 5/2) sandy clay loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, fine, subangular blocky structure; firm, sticky and plastic; few fine pebbles; few fine mica flakes; strongly acid; clear, wavy boundary.

B22t—11 to 17 inches, yellowish-brown (10YR 5/6) light clay loam; many, medium, distinct, gray (10YR 6/1) mot-

tles; moderate, medium, subangular blocky structure; firm, sticky and plastic; thin discontinuous clay films; few fine mica flakes; strongly acid; clear, wavy boundary.

B23tg—17 to 44 inches, gray (10YR 6/1) light clay; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, angular blocky structure; firm, sticky and plastic; thin discontinuous clay films; few fine mica flakes; strongly acid; clear, wavy boundary.

B3tg—44 to 60 inches, gray (10YR 6/1) clay; many, medium, distinct yellowish-brown (10YR 5/6) mottles; weak, medium, angular blocky structure; firm, sticky and plastic; few fine mica flakes; strongly acid; clear, smooth boundary.

IICg—60 to 72 inches, gray (10YR 6/1) gravelly clay loam; massive; 35 to 50 percent, by volume, coarse gravel; few fine mica flakes; strongly acid.

The A horizon is commonly grayish brown but ranges from dark grayish brown to light olive brown. In some areas adjacent to uplands, there is recently deposited reddish alluvium in the A horizon. The upper 20 inches of the Bt horizon is 18 to 35 percent clay. The lower part of the Bt horizon ranges from clay loam to clay. The C horizon is generally stratified with gravelly clay loam, silt, and sand. In some places there are many small concretions in the surface layer and lesser amounts in the subsoil. The solum ranges from 46 to 70 inches in thickness. Bedrock is at a depth of more than 4 feet. Reaction is medium acid to strongly acid throughout the solum.

Augusta soils are similar to the Altavista, Colfax, and Helena soils. They are less well drained and have a grayer Bt horizon than the Altavista soils. They have a less clayey subsoil than Helena soils and lack the fragipan that is characteristic of Colfax soils.

Augusta soils commonly occur near Altavista, Chewacla, Roanoke, and Wickham soils. They are grayer and more poorly drained than Wickham soils. They have more clay in the subsoil than Chewacla soils and are on terraces rather than on flood plains. Augusta soils are better drained than Roanoke soils.

Augusta fine sandy loam, 0 to 2 percent slopes (AuA).—This soil is on low-lying stream terraces. It has a profile similar to the profile described as representative for the series, but the surface layer is a few inches thicker. This soil is subject to occasional overflow from nearby streams, and the water table is within 1 to 2 feet of the surface for several weeks in winter and in spring.

Included with this soil in mapping were a few small areas of poorly drained Roanoke soils and some small areas of soils that have a clayey subsoil. Also included in a few places were soils that have a surface layer of loam or silt loam.

Most of the acreage is used for cultivated crops, hay, and pasture. If drained and adequately fertilized, this soil is fairly well suited to corn, soybeans, hay, and pasture. It is poorly suited to alfalfa, small grain, and tobacco. Fescue is more tolerant of seasonal wetness than most other hay and pasture plants. Capability unit IIIw–1; woodland suitability group 3.

Augusta fine sandy loam, 2 to 6 percent slopes (AuB).—This soil is on low stream terraces adjacent to steeper soils of the uplands or high terraces. This soil has the profile described as representative for the series.

Included in mapping were a few small areas of moderately well drained Altavista soils.

Most of the acreage is used for cultivated crops, hay, and pasture. The water table is within 18 to 24 inches of the surface during wet periods. It restricts the root zone for some crops. Low-lying areas of this soil are subject to floods of short duration. Wetness is of less concern to management on this soil than on Augusta fine sandy loam, 0 to 2 percent slopes. Capability unit IIIw–1; woodland suitability group 3.

Buncombe Series

The Buncombe series consists of deep, excessively drained, sandy, nearly level soils on flood plains. These soils formed in sandy alluvial sediment washed from soils on uplands underlain by igneous and metamorphic rocks.

In a representative profile, the surface layer is loamy sand about 9 inches thick. It is very dark grayish brown in the upper 2 inches and dark yellowish brown below. The underlying layers are of yellowish-brown fine and medium sand that extend to a depth of 72 inches.

Buncombe soils are strongly acid to medium acid and are low in natural fertility. Permeability is rapid, and the available water capacity is low.

Representative profile of Buncombe loamy sand, at Clarkton Bridge along State Highway No. 620, 50 feet north of the Roanoke River:

A1—0 to 2 inches, very dark grayish-brown (10YR 3/2) loamy sand; weak, fine, granular structure; loose; many fine roots; common, fine mica flakes; medium acid; abrupt, smooth boundary.

A2—2 to 9 inches, dark yellowish-brown (10YR 4/4) loamy sand; weak, fine, granular structure; loose; many fine roots; common fine mica flakes; medium acid; clear, smooth boundary.

C1—9 to 36 inches, yellowish-brown (10YR 5/4) fine sand; single grain; loose; common fine mica flakes; medium acid; clear, smooth boundary.

C2—36 to 72 inches; yellowish-brown (10YR 5/4) fine and medium sand; single grain; loose; many fine mica flakes; many dark sand particles; medium acid.

In the A horizon hue is 2.5Y or 10YR value is 3 to 5, and chroma is 2 to 6. The C horizon has a hue of 2.5Y to 7.5YR; its value is 2 to 8, and its chroma is 2 to 6. Below a depth of about 40 inches, some profiles have thin strata that are loamy or gravelly, or both. The depth to hard rock is more than 10 feet. The soil contains few to many flakes of fine mica. Reaction is medium acid to strongly acid.

Buncombe soils are similar to Toccoa soils, but they are excessively drained and have a more sandy profile. Buncombe soils are associated with Chewacla, Congaree, Toccoa, and Wehadkee soils. They are excessively drained, whereas the Chewacla soils are somewhat poorly drained and Wehadkee soils are poorly drained. They contain less silt and clay than the Congaree soils.

Buncombe loamy sand (Bn).—This nearly level soil is on flood plains. It has the profile described as representative for the Buncombe series. Included with this soil in mapping were a few small areas of Toccoa fine sandy loam.

Most of the acreage is wooded. Cleared areas are used for cultivated crops, hay, and pasture. This soil is subject to frequent flooding and is generally droughty in summer and in fall. Capability unit IIIs–1; woodland suitability group 11.

Buncombe-Toccoa complex (Bt).—This mapping unit consists of two nearly level soils that are closely intermingled on flood plains. The acreage of each soil in the unit is about equal. The Buncombe soil generally occurs nearest to the stream channel or is a few inches higher in elevation than the Toccoa soil, or both.

The soils in this mapping unit are frequently flooded, and in places the surface material is changed by major floods. Most of the acreage is used for pasture or is left in

trees. These soils are fairly well suited to cultivated crops and to fescue grown for pasture. They are poorly suited to tobacco and alfalfa. Capability unit IIIs–1; woodland suitability group 11.

Cecil Series

The Cecil series consists of deep, well-drained soils that have a red, clayey layer in the subsoil. These are undulating to hilly soils on uplands. They developed in material weathered from acid igneous and metamorphic rocks. Soils of this series are the most extensive in the county.

In a representative profile, the surface layer is fine sandy loam about 8 inches thick. It is very dark gray in the upper 2 inches and light olive brown below. The subsoil is about 32 inches thick. It is red clay and heavy clay loam and is mottled in the lower part. The substratum is mottled yellowish-red, red, and yellowish-brown clay loam mixed with strongly weathered gneiss. Depth to hard rock is more than 5 feet.

Cecil soils have a strongly acid or very strongly acid subsoil. They are low in fertility. Permeability in the subsoil is moderate. The available water capacity is medium.

Representative profile of Cecil fine sandy loam, 2 to 6 percent slopes, eroded, in an area of oak and pine near Harrisburg on Highway 619, one-half mile west of Wallace Branch, on north side of the road:

A1—0 to 2 inches, very dark gray (10YR 3/1) fine sandy loam; weak, fine, granular structure; very friable; few fine pebbles; many fine roots; medium acid; abrupt, smooth boundary.

A2—2 to 8 inches, light olive-brown (2.5Y 5/4) fine sandy loam; weak, fine, granular structure; very friable; 5 to 10 percent small gravel; many fine roots; strongly acid; clear, wavy boundary.

B1t—8 to 13 inches, red (2.5YR 4/6) clay loam; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; few fine mica flakes; few medium roots; strongly acid; clear, wavy boundary.

B21t—13 to 25 inches, red (10R 5/6) clay; moderate, medium, subangular blocky structure; firm, sticky and plastic; few fine mica flakes; thin discontinuous clay films; strongly acid; clear, wavy boundary.

B22t—25 to 36 inches, red (10R 5/6) clay; few, fine, distinct, reddish-yellow (5YR 6/8) mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; few fine mica flakes; thin discontinuous clay films; strongly acid; clear, wavy boundary.

B3t—36 to 42 inches, red (10R 5/6) clay loam; common, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; 5 to 10 percent fine gravel; few fine mica flakes; strongly acid; gradual, irregular boundary.

C—42 to 68 inches, yellowish-red (5YR 5/6), red (10R 4/6), and yellowish-brown (10YR 5/6), mottled clay loam mixed with friable gneiss; massive; common fine mica flakes; strongly acid.

The A2 horizon ranges from grayish brown to light olive brown in a hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6. Texture of the A horizon is fine sandy loam or fine gravelly sandy loam, except in severely eroded areas where it is clay loam or fine sandy clay loam. The B2t horizon is red; its hue is 2.5YR or 10R, value is 4 to 5, and chroma is 6 or 8. Texture of this horizon is clay or heavy clay loam. The C horizon is loam or clay loam mixed with some coarse fragments that weathered from acid igneous and metamorphic rocks. Thickness of the solum ranges from 40 to 60 inches, and depth to hard rock is more than 5 feet. Reaction is strongly acid or very strongly acid throughout the solum unless the soil has been limed. The solum commonly contains a few fine mica flakes.

Cecil soils are similar to Appling, Madison, and Pacolet soils. They have a redder subsoil than Appling soils, contain fewer mica flakes than Madison soils, and have a thicker solum than Pacolet soils. Cecil soils commonly occur near Appling, Pacolet, Louisburg, and Wedowee soils. Cecil soils differ from Louisburg soils in having more clay in the subsoil and in being deeper to bedrock. They differ from the Wedowee soils in having a redder and thicker Bt horizon.

Cecil fine gravelly sandy loam, 2 to 6 percent slopes, eroded (CcB2).—This gently sloping to undulating soil is on uplands. The surface layer is 20 to 30 percent fine gravel; otherwise, the profile of this soil is similar to the one described as representative for the series. Most of the pebbles are less than one-half inch in diameter.

Included with this soil in mapping were a few small areas of Alluvial land and of Abell soils. They occur on nearly level to gently sloping areas at the heads of some drainageways.

Runoff is slow to medium, but the erosion hazard is only slight if this soil is properly managed. This soil is used mostly for cultivated crops, pasture, and hay. It is well suited to most locally grown crops. Capability unit IIe–4; woodland suitability group 4.

Cecil fine gravelly sandy loam, 6 to 15 percent slopes, eroded (CcD2).—This rolling soil is on uplands. The surface layer is 20 to 30 percent fine gravel by volume. Otherwise, the profile of this soil is similar to the one described as representative for the series. Most of the pebbles are less than one-half inch in diameter.

Included with this soil in mapping were a few small areas of nearly level Alluvial land in areas at the heads of some drainageways. Also included are small areas of severely eroded soils that have a clay loam surface layer.

Runoff is medium to rapid, and the erosion hazard is moderate to severe.

Most of the acreage is wooded, and some fields are planted to pines. Cleared areas are used mostly for pasture and hay. If properly managed, this soil is suitable for cultivated crops. Capability unit IIIe–4; woodland suitability group 4.

Cecil fine gravelly sandy loam, 15 to 25 percent slopes, eroded (CcE2).—This hilly soil is on uplands that adjoin streams and large drainageways. The surface layer is 20 to 30 percent fine gravel, but in other respects this soil has a profile similar to the one described as representative for the series. Most of the pebbles are less than one-half inch in diameter.

Included with this soil in mapping were a few small areas of well-drained to excessively drained Louisburg soils. Also included were small areas of severely eroded soils that have a clay loam surface layer.

Runoff is rapid, and the erosion hazard is very severe.

Most of this soil is wooded. Cleared areas are used mostly for pasture. This soil is poorly suited to cultivated crops. Capability unit IVe–1; woodland suitability group 4.

Cecil fine sandy loam, 2 to 6 percent slopes, eroded (CeB2).—This undulating and gently sloping soil is on uplands. It has the profile described as representative for the Cecil series. The surface layer generally is less than 8 inches thick but in a few places is as much as 14 inches thick.

Included with this soil in mapping were a few small areas of Alluvial land and of Abell soils, which are at the heads of some drainageways. Also included were small

areas of severely eroded soils that have a yellowish-red clay loam surface layer.

Runoff is slow to medium, and the hazard of further erosion is moderate under proper management. This soil is used mostly for cultivated crops, pasture, and hay (fig. 2). It is well suited to most crops grown locally. Capability unit IIe–4; woodland suitability group 4.

Cecil fine sandy loam, 6 to 15 percent slopes, eroded (CeD2).—This rolling soil is on uplands. The surface layer generally is less than 8 inches thick, but in a few places it is as much as 14 inches thick.

Included with this soil in mapping were a few small areas of Alluvial land and of Abell soils, which are at the heads of some drainageways. Also included were small areas of severely eroded soils that have a yellowish-red or red clay loam surface layer.

Runoff is medium to rapid, and the hazard of further erosion is severe where this soil is cultivated. Most of the acreage is wooded. Cleared areas are used mostly for pasture, hay, and cultivated crops. The soil is fairly well suited to cultivated crops if it is well managed. Capability unit IIIe–4; woodland suitability group 4.

Cecil fine sandy loam, 15 to 25 percent slopes, eroded (CeE2).—This hilly soil is in areas that adjoin streams and large drainageways. The profile of this soil is a few inches thinner than the one described as representative for the series.

Included with this soil in mapping were a few small areas of well-drained to excessively drained Louisburg soils and small areas of severely eroded soils that have a yellowish-red or red clay loam surface layer.

Runoff is rapid, and the hazard of further erosion is very severe. Most of this soil is wooded. The cleared areas are used mostly for pasture and hay. This soil is poorly suited to cultivated crops but is fairly well suited to hay and pasture. Capability unit IVe–1; woodland suitability group 4.

Cecil fine sandy loam, very deep, 2 to 6 percent slopes, eroded (CfB2).—This undulating and gently sloping soil is on uplands. Its profile is similar to the one described as representative for the series, but the substratum material underlying this soil is friable, is strongly weathered, and extends to a depth of more than 15 feet. In addition, the subsoil has a higher content of silt and very fine sand.

Included with this soil in mapping were a few small areas of Abell soils at the heads of some drainageways. Also included were small areas of severely eroded soils that have a yellowish-red clay loam surface layer.

Runoff is slow to medium, and the hazard of further erosion is moderate if the soil is properly managed.

Most of the acreage is used for cultivated crops, pasture, and hay. The soil is well suited to most locally grown crops. The friable material in the substratum enables easy excavation to a depth of more than 15 feet. Capability unit IIe–4; woodland suitability group 4.

Cecil fine sandy loam, very deep, 6 to 15 percent slopes, eroded (CfD2).—This rolling soil is on uplands. It has a profile similar to the one described as representative for the series, but the material underlying this soil is friable and extends to bedrock, which is at a depth of more than 15 feet. In addition, the subsoil of this soil has a higher content of silt and very fine sand.

Included with this soil in mapping were a few small areas of Alluvial land and Abell soils that occur at the heads of some drainageways. Also included were small areas of severely eroded soils that have a yellowish-red clay loam surface layer.

Figure 2.—Alfalfa on a gently sloping Cecil soil.

Runoff is medium to rapid, and the hazard of further erosion is severe.

Most of this soil is wooded. Cleared areas are used mostly for pasture, hay, and cultivated crops. This soil is fairly well suited to most locally grown crops. Because the substratum is thick and friable, this soil can be easily excavated to a depth of 15 feet or more. Capability unit IIIe–4; woodland suitability group 4.

Cecil fine sandy loam, very deep, 15 to 25 percent slopes, eroded (CfE2).—This hilly soil is in areas that adjoin streams and large drainageways. It has a profile similar to the one described as representative for the series, but the subsoil has a higher content of silt and very fine sand and the underlying material is friable and extends more than 15 feet to bedrock.

Included with this soil in mapping were a few small areas of well-drained to excessively drained Louisburg soils. Also included were small areas of severely eroded soils that have a yellowish-red clay loam surface layer.

Runoff is rapid, and the hazard of further erosion is very severe.

Most of this soil is wooded. Cleared areas are used mostly for pasture and hay crops. The soil is poorly suited to cultivation but fairly well suited to hay and pasture. The thick, friable substratum enables easy excavation to a depth of more than 15 feet. Capability unit IVe–1; woodland suitability group 4.

Cecil clay loam, 2 to 6 percent slopes, severely eroded (ClB3).—This gently sloping to undulating soil is on uplands. Most of the original surface layer and, in places, part of the subsoil have been removed by erosion. The plow layer is yellowish-red or red clay loam that is mostly subsoil material. Otherwise, the profile of this soil is similar to the one described as representative for the series.

Included with this soil in mapping were small areas of less severely eroded soils that have a fine sandy loam surface layer. Also included were small areas of nearly level Abell soils, which occur at the heads of some drainageways.

Runoff is medium, and the erosion hazard is moderate to severe.

This soil is used mostly for cultivated crops, pasture, and hay. It is not well suited to cultivated crops, but it is fairly well suited to small grain, hay, and pasture. Tilth is poor in most places because the plow layer is sticky when wet and hard when dry. Capability unit IIIe–5; woodland suitability group 5.

Cecil clay loam, 6 to 15 percent slopes, severely eroded (CID3).—This rolling soil is on uplands. Most of the original surface layer and, in places, part of the subsoil have been removed by erosion. The plow layer is yellowish-red or red clay loam. Otherwise, the profile of this soil is similar to the one described as representative for the series.

Included with this soil in mapping were small areas of less severely eroded soils that have a fine sandy loam surface layer. Also included were small areas of Alluvial land adjacent to intermittent drainageways.

Runoff is medium to rapid, and the hazard of erosion is very severe.

This soil is used mostly for cultivated crops, pasture, and hay. It is not well suited to cultivated crops; however, it is fairly well suited to small grain, hay, and pasture. Tilth is poor in most places because the plow layer is sticky when wet and hard when dry. Capability unit IVe-1; woodland suitability group 5.

Cecil clay loam, 15 to 25 percent slopes, severely eroded (CIE3).—Most of the original surface layer of this soil and, in places, part of the subsoil have been removed by severe erosion, and the present surface layer is now yellowish-red or red clay loam. Otherwise, the profile of this soil is similar to the one described as representative for the series.

Included with this soil in mapping were small areas of less severely eroded soils that have a fine sandy loam surface layer. Also included were a few small areas of Gullied land and of excessively drained Louisburg soils.

Runoff is rapid, and the erosion hazard is very severe on this soil.

This soil is used mostly for pasture and hay, to which it is better suited than to most other crops. Tilth is poor in most places because the plow layer is sticky when wet and hard when dry. Capability unit VIe–1; woodland suitability group 5.

Cecil clay loam, very deep, 2 to 6 percent slopes, severely eroded (CmB3).—This gently sloping to undulating soil is on uplands. Its profile is similar to the one described as representative for the series, but most of the original surface layer and, in places, part of the subsoil have been removed by severe erosion. The plow layer is yellowish-red or red clay loam, the subsoil has a higher content of silt and very fine sand, and the substratum is very thick and friable.

Included with this soil in mapping were small areas of less severely eroded soils that have a fine sandy loam surface layer. Also included were small areas of Abell soils at the heads of some drainageways.

Runoff is medium, and the erosion hazard is moderate to severe. This soil is used mostly for cultivated crops, pasture, and hay. Some fields are idle, and others are planted to pine. Tilth is poor in most places because the plow layer is sticky when wet and hard when dry. The thick, friable substratum underlying this soil can be easily excavated to a depth of more than 15 feet. Capability unit IIIe–5; woodland suitability group 5.

Cecil clay loam, very deep, 6 to 15 percent slopes, severely eroded (CmD3).—This rolling soil is on uplands. Most of the original surface layer and, in places, part of the subsoil have been removed by erosion. The present surface layer is yellowish-red or red clay loam. The subsoil has a higher content of silt and very fine sand, and the substratum is very thick and friable. Otherwise, the profile of this soil is similar to the one described as representative for the series.

Included with this soil in mapping were small areas of less severely eroded soils that have a fine sandy loam surface layer. Also included were a few small areas of Alluvial land in nearly level areas at the heads of some drainageways.

Runoff is medium to rapid, and the erosion hazard is severe to very severe.

This soil is used mostly for pasture and hay. It is poorly suited to cultivated crops. Tilth is poor in most places because the surface layer is sticky when wet and hard when dry. The thick, friable substratum underlying this soil can be easily excavated to a depth of more than 15 feet. Capability unit IVe–1; woodland suitability group 5.

Chewacla Series

The Chewacla series consists of deep, somewhat poorly drained, nearly level soils on flood plains along major streams throughout the county. These soils formed in alluvial sediment that washed mostly from residual soils of the Piedmont Plateau.

In a representative profile, the surface layer is brown silt loam about 8 inches thick. The subsoil, which extends to a depth of 52 inches, is yellowish-brown silt loam mottled with gray in the upper part and olive-gray loam mottled with yellowish brown in the lower part. The substratum is gray loamy sand.

Chewacla soils have a medium acid to strongly acid subsoil and are medium to high in fertility. Permeability in the subsoil is moderate, and the available water capacity is high.

Representative profile of Chewacla silt loam, 100 yards west of Randolph and one-fourth mile south of State Highway No. 607:

Ap—0 to 8 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; very friable; few fine mica flakes; few fine roots; medium acid; abrupt, smooth boundary.

B21—8 to 25 inches, yellowish-brown (10YR 5/6) heavy silt loam; many, fine, faint, light brownish-gray (2.5Y 6/2) mottles; weak, medium, subangular blocky structure; friable, slightly sticky and slightly plastic; few fine mica flakes; medium acid; gradual, wavy boundary.

B22—25 to 36 inches, yellowish-brown (10YR 5/6) heavy silt loam; many, fine, faint, light olive-gray (5Y 6/2) mottles; weak, medium, subangular blocky structure; friable, slightly sticky and slightly plastic; few fine mica flakes; medium acid; gradual, wavy boundary.

B3g—36 to 52 inches, olive-gray (5Y 5/2) heavy loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, angular blocky structure; friable, slightly sticky and slightly plastic; common fine mica flakes; few fine concretions; medium acid; clear, smooth boundary.

IICg—52 to 72 inches, gray loamy sand; common fine mica flakes; few fine concretions; medium acid.

The A horizon is brown or dark brown in a hue of 10YR or 7.5YR, a value of 3 to 6, and a chroma of 1 to 4. The upper

part of the B horizon is yellowish brown, dark yellowish brown, brown, or dark brown in a hue of 10YR or 7.5 YR, value of 4 to 6, and chroma of 3 to 6. Mottles having a chroma of 2 or less are within a depth of 20 inches. In the lower part of the B horizon, the amount of gray increases with increasing depth and colors are commonly olive gray or gray with distinct, strong-brown or yellowish-brown mottles. Texture of the B horizon ranges from heavy loam to light silty clay loam. The C horizon is commonly stratified with sand, silt, and gravel. Thickness of the solum ranges from about 37 to 69 inches. Depth to hardrock is 4 to 20 feet or more. Reaction is strongly acid to medium acid.

Chewacla soils are similar to and occur near Congaree and Wehadkee soils. They are more poorly drained than Congaree soils and have gray mottles that are lacking in those soils. Chewacla soils are better drained than Wehadkee soils and lack the gray subsoil that is characteristic of Wehadkee soils.

Chewacla soils are also associated with the Augusta and Roanoke soils. They lack the Bt horizon of the Augusta soils, which occur on stream terraces above the present flood plain. They are better drained than Roanoke soils, which are poorly drained and have a gray clayey subsoil that Chewacla soils lack.

Chewacla silt loam (Cn).—This nearly level soil is on flood plains of the major streams. It is the only soil of the Chewacla series mapped in Charlotte County.

Included with this soil in mapping were a few small areas of soils that have a fine sandy loam surface layer and small areas of poorly drained Wehadkee soils that occupy low-lying areas and former stream channels.

Runoff and infiltration are slow, and this soil is frequently flooded for periods of short duration. The water table is within 1 or 2 feet of the surface in wet periods, generally late in winter and early in spring.

Most of the acreage is wooded. Cleared areas are used for cultivated crops, pasture, and hay. If drained, this soil is suited to most locally grown crops (fig. 3). It is poorly suited to alfalfa because of the seasonal high water table. Capability unit IIIw–1; woodland suitability group 1.

Colfax Series

The Colfax series consists of somewhat poorly drained to moderately well drained, gently sloping soils that have a fragipan in or below the subsoil. These soils formed in the weathered products of acid igneous and metamorphic rocks in areas at the base of slopes and on upland flats.

Figure 3.—Area of Chewacla silt loam used for small grain.

In a representative profile, the surface layer is fine sandy loam about 7 inches thick. It is dark grayish brown in the upper 2 inches and light brownish gray below. The upper 4 inches of the subsoil is light olive-brown sandy clay loam mottled with yellowish brown. The next 21 inches of the subsoil is mottled yellowish-brown and light-gray clay loam. A fragipan 12 inches thick is between depths of 32 and 44 inches. It consists of mottled light-gray and yellowish-brown loam that is hard and brittle. The substratum is mottled loam that contains many quartz fragments.

Colfax soils are strongly acid or very strongly acid in the subsoil and substratum. They are low in natural fertility. The fragipan restricts root growth, and few roots can penetrate it. The available water capacity is medium to low, and permeability is slow.

Representative profile of Colfax fine sandy loam, 2 to 6 percent slopes, on the east side of State Highway No. 654, one-fourth mile south of the junction of State Highways No. 651 and No. 654, 100 yards off the highway:

A1—0 to 2 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; very friable; strongly acid; abrupt, smooth boundary.

A2—2 to 7 inches, light brownish-gray (2.5Y 6/2) fine sandy loam; weak, fine, granular structure; very friable; very strongly acid; clear, smooth boundary.

B1t—7 to 11 inches, light olive-brown (2.5Y 5/4) sandy clay loam; many, fine, distinct, yellowish-brown (10YR 5/8) mottles; weak, fine, subangular blocky structure; friable; very strongly acid; clear, wavy boundary.

B2t—11 to 32 inches, mottled, yellowish-brown (10YR 5/6) and light-gray (10YR 7/2) light clay loam; weak, moderate, subangular blocky structure; friable, slightly sticky, slightly plastic; very strongly acid; clear, smooth boundary.

Bx—32 to 44 inches, mottled light-gray (10YR 7/2) and yellowish-brown (10YR 5/6) heavy loam; weak, medium, platy structure; compact and brittle when dry; firm; very strongly acid; clear, wavy boundary.

C—44 to 52 inches, mottled gray, yellowish-brown, and olive loam saprolite that shows original rock structure; many white and yellow quartz fragments; very strongly acid.

The A1 horizon, if present, has a hue of 10YR or yellower, a value of 4 to 6, and a chroma of 2 to 4. The A2 horizon ranges from pale yellow (2.5Y 7/4) to light brownish gray (2.5Y 6/2). The matrix of the B2t horizon has a hue of 7.5YR or yellower, a value of 5 or 6, and a chroma of 6 or 8. In some profiles the hue is 2.5Y and the chroma is 4. The upper 10 inches of the Bt horizon is mottled, and the chroma is 2 or less. Texture of the Bt horizon ranges from light sandy clay loam to loam. The Bx horizon is mottled in hues of 10YR and 7.5YR; its value is 4 to 8, and its chroma is 2 to 8. Texture of the Bx horizon ranges from heavy sandy loam to sandy clay loam or light clay loam. The thickness of the solum ranges from 40 to 60 inches, and depth to bedrock ranges from 4 to 6 feet or more. Depth to the fragipan is 25 to 40 inches. Reaction is very strongly acid or strongly acid.

Colfax soils are similar to the Augusta and Helena soils. They have a fragipan, which those soils lack, and they have less clay in the subsoil than the Helena soils. In many places Colfax soils occur near Appling, Cecil, Vance, and Worsham soils. They differ from these soils in having less clay in the subsoil and in having a fragipan.

Colfax fine sandy loam, 2 to 6 percent slopes (CoB).—This soil is in slightly concave areas and on broad ridges. It is the only soil of the Colfax series mapped in Charlotte County. The surface layer ranges from 7 to 12 inches in thickness.

Included with this soil in mapping were a few small areas of poorly drained Worsham soils, which occur in

swales and depressions, and small areas of Alluvial land at the heads of some drainageways.

Runoff is slow to medium, but the hazard of erosion is only slight if the soil is properly managed.

This soil is used mostly for cultivated crops, pasture, and hay. There are many wooded areas, and some fields are planted to pines. The water table is within 1 to 2 feet of the surface during wet periods, usually late in winter and early in spring. The fragipan and seasonal wetness are severe limitations to deep-rooted crops and to many nonfarm uses. It is fairly well suited to most locally grown crops. Capability unit IIIw–1; woodland suitability group 3.

Congaree Series

The Congaree series consists of deep, well-drained, nearly level soils on flood plains of streams. These soils formed in alluvial sediment that washed from residual soils of the Piedmont plateau.

In a representative profile, the surface layer is dark yellowish-brown silt loam about 8 inches thick. Below the surface layer is brown silt loam that extends to a depth of 48 inches. The next layer is very dark grayish-brown silt loam that appears to be an old, buried surface layer.

Congaree soils are slightly acid to strongly acid. They are medium to high in fertility. The available water capacity is high, and permeability is moderate.

Representative profile of Congaree silt loam, in a pasture on Staunton Hill Plantation, one-fourth mile north of the Roanoke (Staunton) River:

Ap—0 to 8 inches, dark yellowish-brown (10YR 4/4) silt loam; weak, fine, granular structure; very friable; many fine roots; few fine mica flakes; medium acid; abrupt, smooth boundary.

C1—8 to 17 inches, brown (7.5YR 4/4) silt loam; weak, fine, granular structure; very friable; few fine and medium roots; few fine mica flakes; medium acid; gradual, smooth boundary.

C2—17 to 48 inches, brown (7.5YR 4/4) silt loam; massive; friable; few fine and medium roots; few fine mica flakes; medium acid; gradual, smooth boundary.

Ab—48 to 72 inches, very dark grayish-brown (10YR 3/2) silt loam; massive; friable; few fine mica flakes; medium acid.

The Al horizon, or the Ap horizon in cultivated areas, has a hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 to 6. The C horizon, to a depth of about 20 inches, has a hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 3 to 6. Many profiles contain mottles in a chroma of 2 or less below a depth of 20 inches. Texture of the C1 and C2 horizons is mainly silt loam, but some profiles contain thin horizons of finer or coarser material. Texture below a depth of about 40 inches ranges from loamy coarse sand to silty clay. Depth to bedrock is generally more than 10 feet. Reaction is slightly acid to strongly acid. The content of organic matter is variable with depth, and buried horizons below a depth of 24 inches are common.

Congaree soils are similar to the Chewacla and Toccoa soils. They are well drained and lack the gray mottles that are characteristic of Chewacla soils. They contain more clay than Toccoa soils.

Congaree soils commonly occur near Chewacla, Toccoa, Buncombe, and Wehadkee soils. They differ from Buncombe soils in that they contain more silt and clay. They are better drained than the Wehadkee soils, which are poorly drained, and they have a browner subsoil that is not mottled.

Congaree silt loam (Cr).—This nearly level soil is on flood plains of major streams. It is the only soil of the Congaree series mapped in Charlotte County.

Included with this soil in mapping were a few small areas of Toccoa fine sandy loam and a Chewacla silt loam.

The hazard of erosion is only slight on this Congaree soil except where streams erode their banks. This soil is subject to occasional flooding, but the floodwater does not remain long.

This soil is used mostly for cultivated crops, hay, and pasture. It is well suited to most of the crops grown locally (fig. 4). This soil has severe limitations for most nonfarm uses because of flooding. Capability unit IIw–1; woodland suitability group 1.

Creedmoor Series

The Creedmoor series consists of deep, moderately well drained soils that have a mottled, very slowly permeable subsoil. These soils are undulating to rolling. They formed in materials weathered from Triassic shale, sandstone, and conglomerate on uplands.

In a representative profile, the surface layer is light brownish-gray sandy loam about 7 inches thick. The subsoil extends to a depth of 38 inches. It is mainly yellowish-brown loam to heavy clay loam in the upper part and mottled light yellowish-brown and grayish-brown clay or heavy clay loam in the lower part. The substratum is mottled loam mixed with weathered sandstone and shale fragments.

These soils have a subsoil that is strongly acid to very strongly acid. They are low in natural fertility. Permeability is very slow in the lower part of the subsoil. The available water capacity is medium.

Representative profile of Creedmoor sandy loam, 2 to 6 percent slopes, eroded, 1 mile south of Charlotte Court House, along State Highway No. 47 and 200 feet east of the road:

Ap—0 to 7 inches, light brownish-gray (2.5Y 6/2) sandy loam; weak, fine, granular structure; very friable; few fine and medium roots; few fine pebbles; strongly acid; clear, smooth boundary.

B1t—7 to 12 inches, light yellowish-brown (2.5Y 6/4) loam; many, fine, faint, yellowish-brown (10YR 5/6) mottles; weak, fine, subangular blocky structure; very friable, slightly sticky and slightly plastic; few fine and medium roots; many fine and medium pores; few fine gravel; strongly acid; clear, wavy boundary.

Figure 4.—Barley growing on Congaree silt loam.

B21t—12 to 22 inches, yellowish-brown (10YR 5/6) heavy clay loam; many, fine, distinct, red (2.5YR 5/8) mottles; moderate, fine, subangular blocky structure; firm, sticky and plastic; few medium roots; common fine pores; thin patchy clay films; very strongly acid; clear, wavy boundary.

B22t—22 to 33 inches, light yellowish-brown (2.5Y 6/4) clay; many, fine, distinct, yellowish-red (5YR 4/6) and light brownish-gray (2.5Y 6/2) mottles; moderate, medium, angular blocky structure; very firm, very sticky and very plastic; thin discontinuous clay films; very strongly acid; clear, wavy boundary.

B3t—33 to 38 inches, grayish-brown (2.5Y 5/2) heavy clay loam; many, medium, prominent, red (2.5YR 5/8) and strong-brown (7.5YR 5/8) mottles; weak, medium, angular blocky structure; firm, sticky and plastic; thin patchy clay films; very strongly acid; clear, irregular boundary.

C—38 to 52 inches, mottled weak-red (2.5YR 4/2), yellowish-brown (10YR 5/8), and yellowish-red (5YR 5/8) loamy saprolite; firm; clay flows in cleavage planes and old root channels; many sandstone and shale fragments; very strongly acid.

The A horizon has a hue of 2.5Y or 10YR, value of 4 to 6, and chroma of 2 to 4. The upper part of the B horizon ranges from light yellowish brown (2.5Y 6/4) to strong brown (7.5YR 5/6) in color and from loam to heavy clay loam or light sandy clay in texture. The B22t horizon ranges from light yellowish brown to strong brown mottled with gray. The B3 horizon is highly variable in color and has gray streaks and red mottles. The texture is clay or heavy clay loam. The solum ranges from 32 to 48 inches in thickness. Depth to bedrock is 5 feet or more.

Creedmoor soils are similar to Helena, Mayodan, and Vance soils. They differ from the Mayodan and Vance soils by having gray mottles in the Bt2 horizon. They have redder mottles in the Bt and C horizons than the Helena soils. In addition, they contain more exchangeable aluminum than Helena and Vance soils. Creedmoor soils commonly occur near Mayodan and Pinkston soils. They have a thicker, more clayey subsoil than the Pinkston soils and are much deeper to bedrock.

Creedmoor sandy loam, 2 to 6 percent slopes, eroded (CsB2).—This soil has the profile described as representative for the series. It is on broad ridges and side slopes of uplands. The surface layer is generally less than 8 inches thick, but the thickness ranges from 6 to 10 inches.

Included in mapping were small areas of soils that are grayer throughout than this soil and are more poorly drained.

Runoff is medium, and the hazard of erosion is severe if the soil is cultivated.

Most of the acreage is wooded. Cleared areas are used primarily for pasture, but a few fields are used for cultivated crops. This soil is fairly well suited to some of the crops grown locally. The water table is at a depth of 2 to 3 feet in wet periods, and the soil is poorly suited to alfalfa. Capability unit IIIe–2; woodland suitability group 7.

Creedmore sandy loam, 6 to 10 percent slopes, eroded (CsC2).—This rolling soil is on uplands. The surface layer is generally less than 8 inches thick, but the thickness ranges from 6 to 9 inches. Otherwise, this soil has a profile similar to the one described as representative for the series. Included with this soil in mapping were a few small areas of severely eroded soils that have a yellowish-brown sandy clay loam surface layer and small areas of poorly drained Worsham soils.

Runoff is medium to rapid, and the hazard of further erosion is very severe where this soil is cultivated.

Most of this soil is wooded. Cleared areas are used mostly for pasture, hay, and cultivated crops. This soil is fairly well suited to most crops grown locally. In wet periods the water table is at a depth of 2 to 3 feet; therefore, alfalfa is poorly suited to this soil. Capability unit IVe–2; woodland suitability group 7.

Cullen Series

The Cullen series consists of deep, well-drained soils that have a dark-red clayey layer in the subsoil. These soils are undulating to hilly and are on uplands. They formed in material weathered from mixed acid and basic rocks.

In a representative profile, the surface layer is reddish-brown loam about 6 inches thick. The subsoil extends to a depth of 55 inches. The upper 29 inches of the subsoil is mainly red clay; the next 15 inches is dark-red clay mottled with yellowish brown; and the lower 5 inches is red, mottled clay loam. The substratum is mottled loam that contains weathered rock fragments.

These soils have a medium acid to strongly acid subsoil. They are medium in natural fertility. Permeability is moderate in the subsoil, and the available water capacity is medium.

Representative profile of Cullen loam, 2 to 6 percent slopes, eroded, 3 miles east of Barnes Junction, 2 miles north of State Highway No. 47 on State Highway No. 600, near the Mecklenburg County line, and on west side of the road:

Ap—0 to 6 inches, reddish-brown (5YR 4/4) loam; moderate, fine, granular structure; very friable; many fine roots; common fine and medium pores; 5 to 10 percent fine gravel; medium acid; abrupt, smooth boundary.

B1t—6 to 9 inches, red (2.5YR 4/6) light clay loam; weak, fine, subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium roots; common fine and medium pores; few patchy clay films; 5 to 10 percent fine gravel; medium acid; clear, smooth boundary.

B21t—9 to 35 inches, red (10R 4/6) clay; strong, fine, subangular blocky structure; hard, firm, sticky and plastic; few medium roots; common fine pores; many thin clay films; few fine mica flakes; strongly acid; gradual, wavy boundary.

B22t—35 to 50 inches, dark-red (10R 3/6) clay; few, fine, prominent, yellowish-brown (10YR 5/6) mottles; strong, fine, subangular blocky structure; hard, firm, sticky and plastic; few fine roots; few fine pores; many thin clay films; few fine mica flakes; strongly acid; clear, wavy boundary.

B3t—50 to 55 inches, red (10R 4/6) clay loam; many, medium, prominent, yellowish-brown (10YR 5/8) mottles; moderate, fine, subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few fine pores; common thin patchy clay films; few fine mica flakes; medium acid; clear, wavy boundary.

C—55 to 72 inches, mottled or variegated red (10R 4/6) and yellowish-brown (10YR 5/8) loam that shows original rock structure; thin lenses of brown, black, and white weathered rock; 40 percent weathered rock fragments; common fine mica flakes; strongly acid.

The A horizon is dominantly loam and clay loam, but there are minor areas of fine sandy loam and silt loam. The Ap horizon is dominantly reddish brown (5YR 4/4), but it ranges to brown (7.5YR 5/4) or dark brown (7.5YR 4/2) that grades to yellowish red (5YR 4/8) in eroded areas. The B2t horizon is commonly clay; in places, however, it is heavy clay loam and silty clay. The B3t horizon is red to dark red and has common to many mottles of yellowish brown or strong brown. The C horizon is loam or light clay loam that contains a mixture of weathered hornblende gneiss, granite, or schist. The

solum ranges from 40 to 60 inches in thickness. Depth to hard bedrock is more than 5 feet. Reaction in all horizons is strongly acid to medium acid, except where the soil has been limed. In some places the content of coarse fragments is as much as 10 percent throughout the solum.

Cullen soils are similar to Cecil, Georgeville, and Madison soils. They differ from these soils in having a dark-red horizon as a part of the subsoil.

Cullen soils commonly occur near Appling, Cecil, Grover, and Madison soils. They have a redder subsoil than Appling and Grover soils and have a more clayey subsoil than the Grover soils.

Cullen loam, 2 to 6 percent slopes, eroded (CuB2).—This is an undulating to gently sloping soil on uplands. Slopes are mostly medium in length and slightly convex. This soil has the profile described as representative for the series. Included in mapping were a few small areas of severely eroded soils that have a clay loam surface layer. Also included were small areas of Starr soils at the heads of some drainageways.

Runoff is medium, and the hazard of erosion is moderate where this soil is cultivated. Most of the acreage is used for cultivated crops, pasture, and hay. This soil is well suited to most locally grown crops. Capability unit IIe–4; woodland suitability group 4.

Cullen loam, 6 to 15 percent slopes, eroded (CuD2).—This rolling soil is on uplands. Its profile is similar to the one described as representative for the series, but it is a few inches thinner. Slopes are medium in length and slightly convex. Included with this soil in mapping were a few small areas of gently sloping Starr soils that occupy areas at the heads of some drainageways. Also included were a few small areas of severely eroded soils that have a clay loam surface layer.

Runoff is medium to rapid, and the hazard of further erosion is severe. Most of this soil is wooded. Cleared areas are used for pasture, hay, and cultivated crops. This soil is fairly well suited to most locally grown crops. Capability unit IIIe–4; woodland suitability group 4.

Cullen loam, 15 to 25 percent slopes, eroded (CuE2).—This hilly soil is on uplands. Its profile is similar to the one described as representative for the series, but it is a few inches thinner.

Included with this soil in mapping were a few small areas of gently sloping Starr soils that occupy areas at the heads of some drainageways. Also included were small areas of severely eroded soils that have a clay loam surface layer.

Runoff is rapid, and the hazard of further erosion is very severe. Most of this soil is wooded. Cleared areas are used mostly for pasture or hay. This soil is poorly suited to cultivated crops. It is fairly well suited to pasture and hay crops. Capability unit IVe–1; woodland suitability group 4.

Cullen clay loam, 2 to 6 percent slopes, severely eroded (CvB3).—This is an undulating to gently sloping soil on uplands. Most slopes are medium in length and slightly convex. Most of the original surface layer and, in places, part of the subsoil have been removed by erosion. The present surface layer is yellowish-red clay loam. Otherwise, this soil has a profile similar to the one described as representative for the series.

Included with this soil in mapping were a few small areas of soils that are not severely eroded and that have a loam surface layer. Also included were small areas of nearly level Alluvial land at the heads of some drainageways.

Runoff is medium, and the hazard of further erosion is moderate. Most of the acreage is used for cultivated crops, pasture, and hay. This soil is fairly well suited to general field crops and is well suited to hay and pasture. Capability unit IIIe–5; woodland suitability group 5.

Cullen clay loam, 6 to 15 percent slopes, severely eroded (CvD3).—This rolling soil is on uplands. Most slopes are of medium length and are plane to slightly convex. Most of the original surface layer and, in places, part of the subsoil has been removed by erosion. The present surface layer is yellowish-red clay loam and the profile is a few inches thinner, but in other respects this soil has a profile similar to the one described as representative for the series.

Included with this soil in mapping were a few small areas of soils that have a loam surface layer and small areas of Gullied land.

Runoff is rapid, and the hazard of further erosion is very severe.

Most of this soil is now wooded. Cleared areas are used for pasture, hay, and cultivated crops. This soil is poorly suited to cultivated crops. A good use is for pasture and hay crops. Capability unit IVe–1; woodland suitability group 5.

Enon Series

The Enon series consists of deep, well-drained, undulating to rolling soils on uplands. These soils formed in the weathered products of mixed acidic and basic rocks.

In a representative profile, the surface layer is dark grayish-brown fine sandy loam about 8 inches thick. The subsoil extends to a depth of 30 inches and is strong-brown, very firm clay mottled with yellowish brown and olive brown. The substratum is mottled clay loam that contains many dark- and light-colored rock fragments. Bedrock is at a depth of 42 inches.

These soils have a slightly acid to neutral subsoil. They are medium to low in natural fertility. Permeability is slow because of the high content of clay in the subsoil. The available water capacity is medium.

Representative profile of Enon fine sandy loam, 2 to 6 percent slopes, eroded, in a field planted to pines, 2 miles south to State Highway No. 40 on State Highway No. 654 on west side of the road:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) fine sandy loam; very friable; 5 to 10 percent fine gravel; many fine roots; slightly acid; abrupt, smooth boundary.

B21t—8 to 16 inches, strong-brown (7.5YR 5/6) clay; many, fine, faint yellowish-brown (10YR 5/6) mottles; moderate, fine, subangular blocky structure; very firm, very sticky and very plastic; 5 to 10 percent fine gravel; thin discontinuous clay films; slightly acid; clear, wavy boundary.

B22t—16 to 23 inches, strong-brown (7.5YR 5/6) clay; many, medium, faint yellowish-brown (10YR 5/6) mottles; moderate, fine, angular blocky structure; very firm, very sticky and very plastic; thin discontinuous clay films; 5 to 10 percent fine gravel; few fine concretions; slightly acid; clear, wavy boundary.

B3—23 to 30 inches, yellowish-brown (10YR 5/6) clay; many, medium, faint, light olive-brown (2.5Y 5/6) mottles; weak, medium, angular blocky structure; firm, sticky and plastic; 15 to 20 percent fine, black and green rock fragments; neutral; clear, irregular boundary.

C—30 to 42 inches, mottled olive, yellowish-brown (10YR 5/6), and black (10YR 2/1) clay loam saprolite; massive; very firm; neutral; 50 percent fine, black, green, and white rock fragments.
R—42 inches + mixed schist, gneiss, gabbro, and diorite.

The A horizon has a hue of 7.5YR or yellower, a value of 4 to 6, and a chroma of 2 to 6. Texture of the B3 horizon is clay loam or clay. The solum ranges from 24 to 40 inches in thickness. Depth to hard rock is more than 3 feet. Reaction is slightly acid to neutral.

Enon soils are similar to Iredell, Mecklenburg, and Vance soils. They are better drained and have a browner subsoil than Iredell soils. Enon soils have a Bt horizon that is yellower in hue and less red than that of the Mecklenburg soils. They are less acid and have a browner subsoil than Vance soils.

Enon soils commonly occur near Iredell, Mecklenburg, Appling, and Cecil soils. They are less acid and have a less red subsoil than the Appling and Cecil soils.

Enon fine sandy loam, 2 to 6 percent slopes, eroded (EnB2).—This soil is on uplands. It has the profile described as representative for the series. The surface layer is generally about 8 inches thick, but the thickness ranges from 6 to 9 inches.

Included with this soil in mapping were a few small areas of severely eroded soils that have a clay loam or clay surface layer. Also included were small areas of Abell soils that occupy the heads of some drainageways.

Runoff is medium, and the hazard of further erosion is moderate where this soil is cultivated.

Most of this soil is wooded. Cleared areas are used mainly for cultivated crops, pasture, and hay. This soil is suited to most locally grown crops. Capability unit IIe–2; woodland suitability group 6.

Enon fine sandy loam, 6 to 10 percent slopes, eroded (EnC2).—This sloping soil is on uplands. Slopes are mostly plane and medium in length. The surface layer is commonly less than 3 inches thick, but it ranges from 6 to 9 inches in thickness. Otherwise, the profile of this soil is similar to the one described as representative for the series.

Included with this soil in mapping were a few small areas of severely eroded soils that have a clay loam or clay surface layer and also a few areas where the soil is shallow over bedrock.

Runoff is medium to rapid, and the hazard of further erosion is severe if this soil is used for cultivated crops.

Most of this soil is wooded. Cleared areas are used for pasture, hay, and cultivated crops. This soil is suited to most locally grown crops. Capability unit IIIe–3; woodland suitability group 6.

Enon clay loam, 4 to 12 percent slopes, severely eroded (EoC3).—This rolling soil is on uplands. It has a profile similar to the one described as representative for the series, but most of the original surface layer and, in places, part of the subsoil have been removed by erosion. In addition, the present surface layer is yellowish-brown clay loam.

Included with this soil in mapping were a few small areas where the surface layer is fine sandy loam and small areas where the soil is shallow over bedrock.

Runoff is medium to rapid, and the hazard of further erosion is very severe if the soil is cultivated.

Most of the acreage is used for pasture, hay, and cultivated crops. Many formerly cultivated fields are now idle, and others are planted to pines. Tilth is poor because the surface layer is sticky when wet and hard when dry. This soil is poorly suited to cultivated crops. Capability unit IVe–2; woodland suitability group 5.

Georgeville Series

The Georgeville series consists of deep, well-drained soils that have a red clayey layer in the subsoil. These soils are undulating to hilly and are on uplands. They formed in material weathered from metamorphosed sedimentary rocks.

In a representative profile, the surface layer is silt loam about 8 inches thick, and it contains some fine pebbles. It is very dark gray in the upper 2 inches and brownish yellow below. The subsoil extends to a depth of 56 inches. The upper 4 inches of the subsoil is reddish-yellow silty clay loam; the next 35 inches is distinctly mottled, red clay; and the lower 9 inches is red silty clay loam mottled with yellowish-brown. The substratum is mottled silty clay and contains weathered rock fragments.

Georgeville soils have a strongly acid or very strongly acid subsoil and are low in natural fertility. The subsoil is moderately permeable, and the available water capacity is medium.

Representative profile of Georgeville silt loam, 2 to 6 percent slopes, eroded, in a wooded area, one-half mile southeast of U.S. Highway Nos. 360 and 15 on State Highway No. 646, 100 yards northeast of the road:

O2—½ inch to 0, black, partially decomposed, organic material.
A1—0 to 1½ inches, very dark gray (10YR 3/1) silt loam; weak, fine, granular structure; very friable; abundant fine roots; 5 to 10 percent fine gravel ¼ inch to 1 inch in diameter; medium acid; clear, irregular boundary.
A2—1½ to 8 inches, brownish-yellow (10YR 6/6) silt loam; weak, fine, granular structure; very friable; many fine and medium roots; 5 to 10 percent fine gravel ¼ to 1 inch in diameter; medium acid; clear, irregular boundary.
B1—8 to 12 inches, reddish-yellow (7.5YR 6/6) silty clay loam; many, fine, distinct, brownish-yellow (10YR 6/6) mottles; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; common fine and medium roots; 5 to 10 percent fine gravel; strongly acid; clear, irregular boundary.
B21t—12 to 17 inches, red (2.5YR 4/8) clay; few, fine, distinct, reddish-yellow (7.5YR 6/6) mottles; moderate, fine, subangular blocky structure; firm, sticky and plastic; few medium roots; common medium and fine pores; thin discontinuous clay films; strongly acid; clear, wavy boundary.
B22t—17 to 37 inches, red (10R 4/6) clay; few, fine, distinct, brownish-yellow (10YR 6/6) mottles; strong, fine, subangular blocky structure; firm, sticky and plastic; few medium roots; common fine pores; thin continuous clay films; very strongly acid; gradual, wavy boundary.
B23t—37 to 47 inches, red (10R 4/6) clay; common, fine, distinct, yellowish-brown (10YR 5/6) mottles; strong, fine, subangular blocky structure; firm, sticky and plastic; few medium roots; common fine pores; thin continuous clay films; very strongly acid; gradual, wavy boundary.
B3t—47 to 56 inches, red (10YR 4/6) silty clay loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; thin discontinuous clay films; very strongly acid; gradual, wavy boundary.
C—56 to 80 inches, red (10R 4/6) and yellowish-brown (10YR 5/6), variegated silty clay saprolite; many, thin, white layers of weathered rock; friable; very strongly acid.

The A2 horizon has a hue of 2.5Y to 7.5YR, value of 4 to 6, and chroma of 2 to 8. Texture is silt loam and, in places where the soil is severely eroded, silty clay loam. Hue in the B2t horizon ranges from 2.5YR to 10R; value is 4 or 5, and chroma is 6 to 8. Texture ranges from heavy silty clay loam to clay. Clay content in the B2t horizon is 35 to 50 percent, and the content of silt is more than 30 percent. The B3t horizon ranges from red to yellowish red and has mottles of yellower hue. The texture of this horizon ranges from silt loam to silty clay loam. The C horizon is red, white, and brown, variegated silt loam or silty clay loam material that contains weathered rock fragments. The solum ranges from 40 to 70 inches in thickness. Depth to hard rock is commonly more than 10 feet. Reaction is strongly acid to very strongly acid.

Georgeville soils are similar to the Cecil, Cullen, Herndon, and Turbeville soils. They have a higher content of silt than Cecil soils and a redder B2t horizon than the Herndon soils. Georgeville soils lack the dark-red B2t horizon that is characteristic of Cullen and Turbeville soils. In addition, they have a higher content of silt and very fine sand than Cullen and Turbeville soils.

Georgeville soils commonly occur near Herndon, Goldston, and Orange soils. They have a redder subsoil and are better drained than Orange soils. Georgeville soils are not so deep to bedrock and have a more clayey subsoil than Goldston soils.

Georgeville silt loam, 2 to 6 percent slopes, eroded (GeB2).—This undulating to gently sloping soil is on uplands. It has the profile described as representative for the series. The surface layer is generally less than 8 inches thick but the thickness ranges from 5 to 9 inches.

Included with this soil in mapping were a few small areas of Alluvial land at the heads of some drainageways. Also included were small areas of severely eroded soils that have a silty clay loam surface layer.

Runoff is medium, and the hazard of further erosion is moderate where this soil is cultivated.

Most of this soil is wooded. Cleared areas are used mostly for pasture, hay, and cultivated crops. This soil is well suited to most crops grown locally. Capability unit IIe–4; woodland suitability group 4.

Georgeville silt loam, 6 to 15 percent slopes, eroded (GeD2).—This rolling soil is on uplands. The surface layer is generally less than 7 inches thick, but its thickness ranges from 5 to 9 inches. In other respects, the profile is similar to the one described as representative for the series.

Included with this soil in mapping were a few small areas of Worsham soils at the heads of some drainageways. Also included were small areas of severely eroded soils that have a silty clay loam surface layer.

Runoff is medium to rapid, and the hazard of further erosion is severe.

Most of this soil is wooded. Cleared areas are used mostly for pasture and hay. This soil is fairly well suited to cultivated crops and is well suited to small grain. Capability unit IIIe–4; woodland suitability group 4.

Georgeville silt loam, 15 to 25 percent slopes, eroded (GeE2).—This hilly soil is in areas that adjoin streams and large drainageways. Except that it is a few inches thinner, the profile of this soil is similar to the one described as representative for the series. The surface layer is generally less than 7 inches thick but ranges from 5 to 9 inches in thickness.

Included with this soil in mapping were a few small areas of the steeper Goldston soils on side slopes and some small areas of severely eroded soils that have a silty clay loam surface layer.

Runoff is rapid, and the hazard of further erosion is very severe.

Most of this soil is wooded. Cleared areas are used mostly for pasture and hay. The steepness of slopes makes this soil poorly suited to most crops. Capability unit IVe–1; woodland suitability group 4.

Georgeville silty clay loam, 2 to 6 percent slopes, severely eroded (GgB3).—This undulating to gently sloping soil is on uplands. The original surface layer and, in places, part of the subsoil have been removed by severe erosion. The present surface layer is yellowish-red silty clay loam. Otherwise, this soil has a profile similar to the one described as representative for the series.

Included with this soil in mapping were a few small areas that have a silt loam surface layer. Also included were small areas of Alluvial land that occupy the heads of some drainageways.

Runoff is medium, and the hazard of further erosion is severe.

Most of this soil is now wooded. Some fields are planted to pines. Cleared areas are used mostly for pasture, hay, and cultivated crops. This soil is poorly suited to cultivated crops. It is better suited to small grain, pasture, and hay. Tilth is generally poor because the soil is sticky when wet and hard when dry. Capability unit IIIe–5; woodland suitability group 5.

Georgeville silty clay loam, 6 to 15 percent slopes, severely eroded (GgD3).—This rolling soil is on uplands. Slopes are long and slightly convex. Most of the original surface layer and, in places, part of the subsoil has been removed by erosion. The present surface layer is yellowish-red silty clay loam, and the profile is not so thick as the one described as representative for the series.

Included with this soil in mapping were a few small areas of poorly drained Worsham soils and small areas of soils that have a silt loam surface layer.

Runoff is medium to rapid, and the hazard of further erosion is very severe.

Most of this soil is wooded. Cleared areas are used mostly for pasture and hay. Some formerly cultivated fields are now idle. This soil is poorly suited to most crops. It is fairly well suited to fescue grown for pasture. Tilth is generally poor because the soil is sticky when wet and hard when dry. Capability unit IVe–1; woodland suitability group 5.

Goldston Series

The Goldston series consists of moderately deep, well-drained to excessively drained soils that have a slaty silt loam or slaty silty clay loam subsoil. These are undulating to hilly soils on uplands. They formed in the weathered products of metamorphosed igneous and sedimentary rocks.

In a representative profile, the surface layer is silt loam about 7 inches thick. It is dark grayish brown in the upper 2 inches and light brownish gray below. The subsoil is light yellowish-brown slaty silt loam that extends to a depth of 15 inches. The substratum is mottled and contains many coarse fragments. Slate bedrock is at a depth of 23 inches.

These soils are strongly acid to very strongly acid and are low in natural fertility. Permeability is moderately rapid, and the available water capacity is very low.

Representative profile of Goldston silt loam, 4 to 10 percent slopes, in a wooded area, near State Highway No. 687, one-half mile south of Fort Mitchell on west side of road:

A1—0 to 2 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable; 5 to 10 percent fine gravel; many fine roots; clear, smooth boundary.

A2—2 to 7 inches, light brownish-gray (2.5Y 6/2) silt loam; weak, fine, granular structure; very friable; 15 to 25 percent slate fragments; many fine roots; strongly acid; clear, smooth boundary.

B—7 to 15 inches, light yellowish-brown (2.5Y 6/4) slaty silt loam; weak, fine, subangular blocky structure; very friable; 35 to 50 percent slate fragments; strongly acid; clear, irregular boundary.

C—15 to 23 inches, pale-brown and yellow very slaty silt loam saprolite; content of coarse fragments ranges from 50 to 80 percent, by volume; strongly acid.

R—23 inches, pale-brown, strong-brown, and olive-colored, hard, fine-grained Aaron slate.

The Al horizon, where present, ranges from 1 to 3 inches in thickness and is commonly dark grayish brown. In cultivated or disturbed fields, the Ap horizon is commonly brown (10YR 5/3), but its hue ranges from 10YR to 2.5Y, value from 4 to 6, and chroma from 2 to 4. Texture of the A horizon is silt loam or, rarely, very fine sandy loam that has a variable amount of slaty rock fragments and, in places, angular quartz fragments. The B horizon is light yellowish brown (10YR 6/4) or brown (10YR 5/3), but its hue ranges from 5YR to 2.5Y, value from 4 to 7, and chroma from 4 to 6. Mottles of strong brown and yellowish red are in many profiles. Texture of the B horizon is slaty silt loam that is more than 35 percent shale or slate fragments, by volume. This horizon is broken within distances of a few feet by a thin discontinuous Bt horizon. The Bt horizon is heavy slaty silt loam or slaty silty clay loam that has the same range in color as the loam in the rest of the B horizon. The C horizon is saprolite derived from fine-grained volcanic or sedimentary rocks. Texture is very slaty silt loam that is more than half shale or slate fragments, by volume. The solum is generally less than 20 inches thick. Depth to hard bedrock ranges from 20 to 36 inches. Reaction is strongly acid or very strongly acid unless the soil has been limed.

Goldston soils are similar to the Louisburg and Pinkston soils. They differ from those soils in having more than 35 percent coarse fragments, and they are more silty in the subsoil. Goldston soils commonly occur near Georgeville, Herndon, and Orange soils. They differ from all of those soils because they are deeper to bedrock and have a less clayey subsoil.

Goldston silt loam, 4 to 10 percent slopes (GoC).—This soil has the profile described as representative for the series. The soil is undulating to rolling and is in the eastern part of the county. Its surface layer ranges from 5 to 9 inches in thickness.

Included with this soil in mapping were a few small areas where the soil is shallow to bedrock.

Runoff is medium to rapid, and the hazard of erosion is very severe where this soil is cultivated.

Most of this Goldston soil is wooded. Cleared areas are used mostly for pasture and hay. The soil is poorly suited to cultivated crops but is fairly well suited to hay and pasture plants. Plants commonly are damaged from the lack of water during dry periods. Capability unit IVe–3; woodland suitability group 8.

Goldston silt loam, 10 to 15 percent slopes (GoD).—This rolling soil is in the eastern part of the county. Slopes are mostly short and slightly convex. The profile of this soil is similar to the one described as representative for the series, but the surface layer ranges from 5 to 9 inches in thickness.

Included with this soil in mapping were a few small areas where the soil is shallow over bedrock.

Runoff is medium to rapid, and the hazard of erosion is severe. Most of this Goldston soil is wooded. Cleared areas are used mostly for pasture and hay. This soil is poorly suited to cultivated crops. Capability unit VIe–3; woodland suitability group 8.

Goldston silt loam, 15 to 35 percent slopes (GoF).—This hilly to steep soil is adjacent to streams or large drainageways. It has a profile similar to the one described as representative for the series, but the soil is a few inches shallower to bedrock.

Included with this soil in mapping were a few areas where the soil is shallow over bedrock.

Runoff is rapid, and the hazard of erosion is very severe if the soil is disturbed. Most of this Goldston soil is wooded.

Cleared areas are used for pasture and hay. This soil is not suited to cultivated crops and is poorly suited to pasture. Capability unit VIIe–1; woodland suitability group 8.

Grover Series

The Grover series consists of deep, well-drained soils that have a loamy, micaceous subsoil. These undulating to hilly soils are on uplands. They formed in the weathered products of highly micaceous igneous and metamorphic rocks.

In a representative profile, the surface layer is sandy loam about 6 inches thick. It is dark grayish brown in the upper 2 inches and light yellowish brown below. The subsoil extends to a depth of 28 inches. The upper 4 inches of the subsoil is yellowish-brown loam; the next 14 inches is strong-brown light clay loam that is faintly mottled with yellowish red; and the lower 4 inches is distinctly mottled, strong-brown loam. The substratum is pale-brown loam mixed with about 50 percent fine mica flakes.

Grover soils have a strongly acid to a very strongly acid subsoil and are low in natural fertility. Permeability is moderate, and the available water capacity is medium.

Representative profile of Grover sandy loam, 6 to 15 percent slopes, eroded, in woodland on Staunton Hill Plantation, one-fourth mile south of State Highway No. 619, along the west side of a paved lane:

A1—0 to 2 inches, dark grayish-brown (10YR 4/2) sandy loam; weak, fine, granular structure; very friable; many fine roots; 15 to 20 percent fine gravel; many fine mica flakes; medium acid; abrupt, smooth boundary.

A2—2 to 6 inches, light yellowish-brown (10YR 6/4) sandy loam; weak, fine, granular structure; very friable; many fine roots; 15 to 20 percent fine gravel; many fine mica flakes; medium acid; clear, smooth boundary.

B1—6 to 10 inches, yellowish-brown (10YR 5/4) loam; weak, fine, subangular blocky structure; very friable; common fine and medium roots; few fine pebbles; many fine mica flakes; strongly acid; clear, wavy boundary.

B2t—10 to 24 inches, strong-brown (7.5YR 5/8) light clay loam; many, fine, faint, yellowish-red (5YR 5/8) mottles; moderate, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; few medium roots; many fine and medium pores; thin patchy clay films; few fine pebbles; many fine mica flakes; strongly acid; clear, smooth boundary.

B3t—24 to 28 inches, strong-brown (7.5YR 5/8) loam; many, fine, distinct, light yellowish-brown (10YR 6/4) mottles; weak, fine, subangular blocky structure; very friable, slightly sticky and slightly plastic; few medium roots; many fine and medium pores; thin patchy clay films; 30 to 40 percent fine mica flakes; strongly acid; clear, wavy boundary.

C—28 to 52 inches, pale-brown (10YR 6/3) loam that shows original rock structure; friable; about 50 percent fine mica flakes; strongly acid.

The A1 horizon ranges from very dark grayish brown to dark grayish brown. The A2 horizon ranges from light yellowish brown to brown. Few to common coarse fragments occur in some profiles. The Bt horizon ranges from yellowish brown to yellowish red. Its texture is heavy loam or light clay loam. Few to many fine mica flakes are in the upper part of this horizon, and the content of mica flakes increases with depth. The abundant mica flakes give the soil material a smooth, greasy feel. The B3 horizon ranges from yellowish brown to yellowish red and from loam to light clay. The C horizon is friable, weathered micaceous schist or gneiss. The solum ranges from 22 to 40 inches in thickness. Depth to hard rock is 3 to 10 feet. Reaction is strongly acid to very strongly acid.

Grover soils are similar to the Appling, Madison, and Pacolet soils. They have a less clayey Bt horizon and contain larger amounts of mica flakes than those soils. Grover soils commonly occur near Appling, Louisa, Madison, and Pacolet soils. They are deeper to bedrock than the Louisa soils and are less sandy in the subsoil.

Grover sandy loam, 2 to 6 percent slopes, eroded (GrB2).—This gently sloping to undulating soil is on ridges in the uplands. Its surface layer ranges from 5 to 12 inches in thickness but it is generally less than 8 inches thick. Otherwise, it has a profile similar to the one described as representative for the series.

Included with this soil in mapping were a few small areas of Abell soils that are at the heads of some drainageways and a few areas of severely eroded soils that have a sandy clay loam surface layer.

Runoff is medium, and the hazard of further erosion is moderate. Most of this soil is wooded. Cleared areas are used for pasture, hay, and cultivated crops. This soil is well suited to most of the crops grown locally. Capability unit IIe–1; woodland suitability group 4.

Grover sandy loam, 6 to 15 percent slopes, eroded (GrD2).—This rolling soil is on uplands. Most slopes are weakly convex and of medium length. This soil has the profile described as representative for the series. The surface layer generally is less than 8 inches thick but ranges from 5 to 12 inches in thickness.

Included with this soil in mapping were a few areas of severely eroded soils that have a sandy clay loam surface layer. Also included were a few areas of Alluvial land at the heads of some drainageways.

Runoff is medium to rapid, and the hazard of further erosion is severe. Most of this soil is wooded. Cleared areas are used mostly for pasture and hay. Capability unit IIIe–1; woodland suitability group 4.

Gullied Land

Gullied land-Cecil complex, moderately steep (GuE) consists of areas of the land type Gullied land and of moderately steep, severely eroded, and gullied areas of Cecil, Appling, Georgeville, Herndon, and Turbeville soils on uplands. Cecil soils are dominant in these areas. The gullies are a few to many feet deep and make up more than half of each mapped area. In places the gullies have eroded to bedrock, but some small areas between the gullies still contain much of the original surface layer. Erosion continues at a rapid rate in most of the mapped areas.

Most areas of this complex are wooded, and some old fields have been planted to pines. The cleared areas are used for pasture or are idle. This mapping unit is not suitable for cropland and is poorly suited to pasture. Capability unit VIIe–1; woodland suitability group 5.

Helena Series

The Helena series consists of deep, moderately well drained soils that have a mottled clayey layer in the subsoil. These undulating to rolling soils are on uplands. They formed in material weathered from mixed acid and basic crystalline rocks.

In a representative profile, the surface layer is fine sandy loam about 13 inches thick. It is grayish brown in the upper 3 inches and light yellowish brown below. The subsoil, which extends to a depth of 37 inches, is light yellowish-brown sandy clay loam in the upper 6 inches and mottled yellowish-brown clay in the main part. The substratum is mottled gray and yellowish-brown loam mixed with weathered rock material.

These soils have a strongly acid to very strongly acid subsoil and are low in natural fertility. Permeability is slow, and the available water capacity is medium.

Representative profile of Helena fine sandy loam, 2 to 6 percent slopes, eroded, in woodland at the Prince Edward County line on State Highway No. 671, 2 miles south of junction of State Highways No. 671 and No. 654, on west side of the road:

A1—0 to 3 inches, grayish-brown (2.5Y 5/2) fine sandy loam; weak, fine, granular structure; very friable; 5 to 10 percent fine gravel; many fine roots; strongly acid; clear, smooth boundary.

A2—3 to 9 inches, light yellowish-brown (2.5Y 6/4) fine sandy loam; weak, fine, granular structure; very friable; 5 to 10 percent fine gravel; common fine roots; strongly acid; clear, wavy boundary.

A3—9 to 13 inches, light yellowish-brown (2.5Y 6/4) fine sandy loam; few, fine, distinct, brownish-yellow (10YR 6/6) mottles; weak, fine, subangular blocky structure; very friable; few medium roots; strongly acid; clear, wavy boundary.

B21t—13 to 19 inches, light yellowish-brown (2.5Y 6/4) sandy clay loam; common, fine, faint, yellowish-brown (10YR 5/6) mottles; weak, medium, subangular blocky structure; firm, sticky and plastic; strongly acid; clear, wavy boundary.

B22t—19 to 31 inches, yellowish-brown (10YR 5/6) clay; common, fine, distinct, yellowish-red (5YR 4/6) and gray (10YR 6/1) mottles; weak, medium, angular blocky structure; very firm, very sticky and very plastic; thin discontinuous clay films; very strong acid; clear, wavy boundary.

B3t—31 to 37 inches, yellowish-brown (10YR 5/6) clay; common, fine, prominent, light olive-gray (5Y 6/2) mottles; weak, medium, angular blocky structure; very firm, very sticky and very plastic; thin discontinuous clay films; very strongly acid; clear, irregular boundary.

C—37 to 52 inches, gray and yellowish-brown loam saprolite that shows original rock structure; weathered from granite gneiss.

The A horizon has a hue of 2.5Y or 10YR, a value of 4 to 8, and a chroma of 1 to 5. This horizon is fine sandy loam or fine gravelly sandy loam that contains as much as 35 percent angular quartz gravel, by volume. The Bt horizon is centered on yellowish brown (10YR 5/6), but its hue ranges from 5Y to 7.5YR, value from 5 to 7, and chroma from 4 to 8. Faint to distinct mottles having a chroma of 2 or less are in the upper 24 inches of the Bt horizon. The B22t and B3t horizons range from sandy clay to clay and are from 35 to 60 percent clay. Consistence in the lower part of the Bt horizon is firm or very firm. The solum ranges from 20 to 50 inches in thickness. Depth to hard rock is more than 4 feet. Reaction is strongly acid or very strongly acid.

Helena soils are similar to the Creedmoor and Vance soils. They lack the red mottles in the solum and the high exchangeable aluminum characteristic of the Creedmoor soils. They

differ from Vance soils in having gray mottles within a depth of 24 inches.

Helena soils commonly occur near Appling, Colfax, and Vance soils. They differ from Appling soils in being moderately well drained and in having gray mottles within a depth of 24 inches. Helena soils do not have a fragipan as do the Colfax soils.

Helena fine gravelly sandy loam, 2 to 6 percent slopes (HeB).—This soil is on weakly convex ridgetops and smooth, moderately long side slopes. It has a profile similar to the one described as representative for the series, but the surface layer is fine gravelly sandy loam that generally is less than 8 inches thick.

Included with this soil in mapping were a few small areas of Abell soils that are at the heads of some drainageways and small areas of Vance fine gravelly sandy loam, 2 to 6 percent slopes, eroded.

Runoff is medium, and the hazard of further erosion is severe where this soil is cultivated. Most of the acreage is used for cultivated crops, pasture, and hay. This soil is suited to most of the locally grown crops. It is poorly suited to deep-rooting crops, such as alfalfa. Capability unit IIIe–2; woodland suitability group 7.

Helena fine gravelly sandy loam, 6 to 10 percent slopes, eroded (HeC2).—This rolling soil is on uplands. Slopes are mostly medium in length and are slightly convex or plane. This soil has a fine gravelly sandy loam surface layer that generally is less than 8 inches thick; otherwise, its profile is similar to the one described as representative for the series.

Included with this soil in mapping were a few small areas of Vance fine gravelly sandy loam, 6 to 15 percent slopes, eroded. Also included were small areas of Alluvial land at the heads of some drainageways.

Runoff is medium, and the hazard of further erosion is very severe.

Most of the acreage is used for pasture, hay, and cultivated crops. This Helena soil is suited to most of the crops grown locally. It is poorly suited to deep-rooting crops, such as alfalfa. The seasonal high water table is within 2 to 3 feet of the surface in wet periods. Capability unit IVe–2; woodland suitability group 7.

Helena fine sandy loam, 2 to 6 percent slopes, eroded (HfB2).—This undulating to gently sloping soil is on uplands. It has a profile similar to the one described as representative for the series, but the surface layer is not so thick. Generally, it is less than 8 inches thick.

Included with this soil in mapping were a few small areas of Abell soils at the heads of some drainageways.

Runoff is medium, and the hazard of further erosion is severe if the soil is cultivated. In wet periods the water table rises to within 2 or 3 feet of the surface.

Most of the acreage is used for cultivated crops, pasture, and hay. This soil is poorly suited to deep-rooted crops but is fairly well suited to most other crops grown locally. Capability unit IIIe–2; woodland suitability group 7.

Helena fine sandy loam, 6 to 10 percent slopes, eroded (HfC2).—This rolling soil is on uplands. It has a profile similar to the one described as representative for the series, but the surface layer is not so thick.

Included with this soil in mapping were a few small areas of Alluvial land at the heads of some drainageways. Also included were small areas of severely eroded soils that have a yellowish-brown clay loam surface layer.

Runoff is medium, and the hazard of further erosion is very severe where this soil is cultivated.

Most of this soil is wooded. Cleared areas are used mostly for pasture, hay, and cultivated crops. The erosion hazard, seasonal high water table, and slow permeability are the major concerns of management. This soil is poorly suited to deep-rooting crops, but it is fairly well suited to most other crops grown locally. Capability unit IVe–2; woodland suitability group 7.

Herndon Series

The Herndon series consists of deep, well-drained, undulating and rolling soils on uplands. These soils formed in the weathered products of metamorphosed sedimentary and volcanic rocks.

In a representative profile, the surface layer is mainly light yellowish-brown silt loam about 8 inches thick. This layer is from 5 to 10 percent fine gravel. The subsoil, which extends to a depth of 54 inches, ranges from yellowish red to yellowish brown in color and from heavy silt loam to clay in texture. The substratum is mottled, strong-brown and yellowish-brown silt loam that has white streaks of weathered rock strata.

These soils have a strongly acid to very strongly acid subsoil and are low in natural fertility. Permeability is moderate, and the available water capacity is high.

Representative profile of Herndon silt loam, 2 to 6 percent slopes, eroded, in a forest one-half mile southeast of U.S. Highway Nos. 360 and 15 on State Highway No. 646, one-half mile northeast along a logging trail:

O2—½ inch to 0, black, partly decomposed organic material.

A1—0 to 1 inch, dark-gray (10YR 4/1) silt loam; weak, fine, granular structure; very friable; abundant fine roots; 5 to 10 percent fine gravel ½ inch to 2 inches in diameter; medium acid; abrupt, smooth boundary.

A2—1 to 8 inches, light yellowish-brown (2.5Y 6/4) silt loam; weak, fine, granular structure; very friable; many fine roots; 5 to 10 percent fine gravel ½ inch to 2 inches in diameter; strongly acid; clear, wavy boundary.

B1—8 to 11 inches, yellow (10YR 7/6) silt loam; many, medium, distinct, reddish-yellow (7.5YR 6/8) mottles; weak, fine, granular structure; very friable; many fine and medium roots; 5 to 10 percent fine gravel; strongly acid; clear, wavy boundary.

B21t—11 to 14 inches, strong-brown (7.5YR 5/8) silty clay loam; many, medium, distinct, brownish-yellow (10YR 6/8) mottles; moderate, fine, subangular blocky structure; friable, sticky and slightly plastic; few fine and medium roots; common fine pores; 5 to 10 percent fine gravel; strongly acid; clear, wavy boundary.

B22t—14 to 33 inches, yellowish-red (5YR 5/6) clay; many, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; common fine pores; thin continuous clay films; very strongly acid; gradual, wavy boundary.

B23t—33 to 44 inches, yellowish-brown (10YR 5/6) silty clay loam; many, medium, distinct, red (2.5YR 4/6) mottles; moderate, medium, subangular blocky structure; firm, sticky and slightly plastic; common fine pores; thin discontinuous clay films; very strongly acid; gradual, irregular boundary.

B3—44 to 54 inches, strong-brown (7.5YR 5/6) silt loam; many, medium, distinct, red (2.5YR 4/6) and yellowish-brown (10YR 5/6) mottles; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; common fine pores; very strongly acid; gradual, wavy boundary.

C—54 to 72 inches, strong-brown (7.5YR 5/6) and yellowish-brown (10YR 5/6), variegated silt loam saprolite that

shows original rock structure; friable; thin white seams of weathered sericite-schist; very strongly acid.

The A1 horizon ranges from dark gray to dark grayish brown. The A2 horizon is generally light yellowish brown but ranges from pale brown to yellowish brown. The surface layer is mostly silt loam but in places it is loam. Generally, it is 5 to 15 percent fine gravel. The Bt horizon has a hue of 5YR to 10YR, a value of 5 to 7, and a chroma of 4 to 8. Mottles range from red to pale brown. The B2t horizon ranges from heavy silty clay loam to clay, and the B3 horizon from loam to silty clay loam. The solum is 40 to 60 inches thick. Depth to hard rock is more than 7 feet. Reaction is strongly acid to very strongly acid in the subsoil.

Herndon soils are similar to Appling, Georgeville, and Mayodan soils. They differ from the Appling and Mayodan soils in that they are more than 30 percent silt in the upper 20 inches of the B2t horizon. They have less aluminum than the Mayodan soils and do not have a red B2t horizon as do the Georgeville soils.

Herndon soils commonly occur near Georgeville, Goldston, Orange, and Worsham soils. They are deeper and have a more clayey Bt horizon than the Goldston soils. They are better drained than Orange and Worsham soils, and they lack the gray colors in the B2t horizon that are characteristic of those soils.

Herndon silt loam, 2 to 6 percent slopes, eroded (HnB2).—This is an undulating to gently sloping soil on uplands. It has the profile described as representative for the series. The surface layer generally is 7 to 13 inches thick.

Included with this soil in mapping were a few small areas of Orange silt loam, 2 to 6 percent slopes, eroded. Also included were a few areas of severely eroded soils that have a yellowish-red silty clay loam surface layer.

Runoff is medium, and the hazard of further erosion is moderate where this soil is cultivated. Most of this soil is wooded. Cleared areas are used mostly for pasture, hay, and cultivated crops. This soil is well suited to most crops grown locally. Capability unit IIe–1; woodland suitability group 4.

Herndon silt loam, 6 to 15 percent slopes, eroded (HnD2).—This rolling soil is on uplands. It has a profile similar to the one described as representative for the series, but the surface layer is not so thick. Generally, it is less than 7 inches thick. Slopes are mostly medium in length and are slightly convex or plane.

Included with this soil in mapping were a few small areas of severely eroded soils that have a yellowish-red clay loam surface layer and small areas of Goldston silt loam, 10 to 15 percent slopes.

Runoff is medium to rapid, and the hazard of further erosion is severe. Most of the acreage is wooded. Cleared areas are used mostly for pasture and hay. This Herndon soil is fairly well suited to most locally grown crops. Capability unit IIIe–1; woodland suitability group 4.

Herndon silty clay loam, 2 to 6 percent slopes, severely eroded (HrB3).—This gently sloping soil is on uplands. Most slopes are medium in length and slightly convex. Nearly all of the original surface layer and, in places, the upper part of the subsoil have been removed by erosion. The present surface layer is yellowish-red silty clay loam and the profile is not so thick, but in other respects this soil has a profile that is similar to the one described as representative for the series.

Included with this soil in mapping were a few small areas of soils that are not severely eroded and that have a silt loam surface layer. Also included were small areas of nearly level Alluvial land and Worsham soils that occupy areas at the heads of drainageways.

Runoff is medium, and the hazard of further erosion is severe. Tilth is poor.

Most of the acreage is now wooded. Some cleared areas are used for pasture, hay, and cultivated crops. Many formerly cultivated fields are now idle, and others are planted to pines. This soil is poorly suited to cultivated crops but is well suited to small grain. Capability unit IIIe–5; woodland suitability group 5.

Herndon silty clay loam, 6 to 15 percent slopes, severely eroded (HrD3).—This rolling soil is on uplands. Slopes are mostly slightly convex and medium in length. Nearly all of the original surface layer and, in places, the upper part of the subsoil has been removed by erosion. Except that its present surface layer is yellowish-red silty clay loam and its profile is a few inches thinner, this soil has a profile that is similar to the one described as representative for the series.

Included with this soil in mapping were a few small areas of Gullied land. Also included were small areas of nearly level Alluvial land at the heads of some drainageways.

Runoff is medium to rapid, and the hazard of further erosion is very severe.

Most of the acreage is now wooded. Some cleared areas are used mostly for pasture and hay. Many formerly cultivated fields are now idle, and others are planted to pines. This soil is poorly suited to cultivated crops. It is fairly well suited to small grain and pasture. Capability unit IVe–1; woodland suitability group 5.

Iredell Series

The Iredell series consists of moderately deep to deep, moderately well drained soils that have a plastic, clayey subsoil. These undulating and rolling soils are on uplands. They formed in residuum from fine-grained basic rocks.

In a representative profile, the surface layer is dark grayish-brown loam 6 inches thick. This layer is 5 to 10 percent gravel and contains some fine, hard concretions. The subsoil, which extends to a depth of 37 inches, is mainly light olive-brown to olive clay that is very plastic and sticky when wet. The substratum is a mixture of loam and weathered basic rocks. Hard bedrock is at a depth of 48 inches.

These soils have a slightly acid to neutral subsoil and are medium in natural fertility. They are medium in available water capacity and have slow permeability. The subsoil has a high shrink-swell potential, and infiltration of water is very slow when the profile is saturated.

Representative profile of Iredell loam, 2 to 6 percent slopes, on U.S. Highway No. 15, near Mecklenburg County line, at St. Ledel Church, 100 feet east of the road:

Ap—0 to 6 inches, dark grayish-brown (2.5Y 4/2) loam; weak, fine, granular structure; very friable; common fine roots; few fine concretions; 5 to 10 percent fine gravel 1 to 2 inches in diameter; slightly acid; abrupt, smooth boundary.

B1—6 to 9 inches, grayish-brown (2.5Y 5/2) heavy loam; many, fine, faint, light olive-brown (2.5Y 5/6) mottles; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; few fine concretions; 5 to 10 percent fine gravel; slightly acid; clear, wavy boundary.

B21t—9 to 14 inches, light olive-brown (2.5Y 5/6) clay; many, fine, faint, yellowish-brown (10YR 5/6) mottles; weak, medium, angular blocky structure; very firm, very sticky and very plastic; few medium roots; few fine tubular pores; few thin clay films; slightly acid; clear, wavy boundary.

B22t—14 to 33 inches, light olive-brown (2.5Y 5/4) clay; weak, coarse, angular blocky structure; very firm, very sticky and very plastic; very few medium roots; few fine tubular pores; few thin clay films; slightly acid; clear, wavy boundary.

B3t—33 to 37 inches, olive (5Y 4/4) clay; weak, coarse, angular blocky structure; firm, sticky and plastic; few thin clay films; neutral; clear, irregular boundary.

C—37 to 48 inches, mottled, light olive-brown (2.5Y 5/4) and olive (5Y 4/4) saprolite mixed with loam and weathered rock; firm in place; weathered rock crumbles with slight pressure; neutral.

R—48 inches, hard, brown and olive with black streaks, slightly weathered gabbro bedrock.

Texture of the A horizon is mostly loam, but it ranges from fine sandy loam to loam. The A1 horizon, where present, is less than 6 inches thick and has a hue of 10YR to 5Y, a value of 3 or 4, and a chroma that is less than 3. The A2 horizon has a hue of 10YR to 5Y, a value of 3 to 6, and a chroma of 1 to 5. The Bt horizon is more than 50 percent clay. Its color is in a hue of 10YR to 5Y, its value is 4 to 5, and its chroma is 4 to 8; some of its mottles have a higher value and chroma. In a few places the A horizon overlying the Bt horizon has a high content of concretions. Mostly, the surface layer contains many to few concretions. The solum is 20 to 40 inches thick. Depth to hard rock ranges from 2 to 5 feet. Reaction is slightly acid to neutral.

Iredell soils are similar to Enon, Mecklenburg, and Orange soils. They are more poorly drained than Enon and Mecklenburg soils and have a more olive color in the subsoil. They differ from Orange soils in lacking grayish-brown mottles in the upper 10 inches of the Bt horizon. Iredell soils commonly occur near Enon, Mecklenburg, Wilkes, and Worsham soils. They are deeper to bedrock than the Wilkes soils and are better drained than the Worsham soils.

Iredell loam, 2 to 6 percent slopes (IrB).—This soil is on uplands. It has the profile described as representative for the series. Most slopes are slightly convex or plane.

Included with this soil in mapping were a few small areas of Wilkes soils and small areas of soils that have a concretionary layer between the surface layer and the subsoil.

Runoff is medium, and the hazard of erosion is severe where this soil is cultivated. Most of the acreage is wooded. Cleared areas are used mostly for pasture, hay, and cultivated crops. This soil is fairly well suited to most locally grown crops but is poorly suited to alfalfa. Capability unit IIIe–2; woodland suitability group 10.

Iredell loam, 2 to 6 percent slopes, eroded (IrB2).—This soil is on broad ridges of the uplands. Most slopes are slightly convex and medium in length. Part of the original surface layer has been removed by erosion, and the plow layer now has some subsoil material mixed into it. Otherwise, the profile of this soil is similar to the one described as representative for the series.

Included with this soil in mapping were a few small areas of Wilkes soils and small areas of soils that have a concretionary layer between the surface and the subsoil.

Runoff is medium, and the hazard of further erosion is moderate if this soil is under good management. Most of the acreage is wooded. Cleared areas are used mostly for pasture, hay, and cultivated crops. This soil is poorly suited to most crops. It is fairly well suited to pasture. Capability unit IVe–2; woodland suitability group 10.

Iredell loam, 6 to 10 percent slopes, eroded (IrC2).—This soil is on uplands. Most slopes are medium in length and slightly concave. Part of the original surface layer has been removed by erosion, and the plow layer now has a small amount of subsoil material mixed into it. Otherwise, the profile of this soil is similar to the one described as representative for the series.

Included with this soil in mapping were a few small areas of Wilkes soils and small areas of severely eroded soils that have a clay loam surface layer.

Runoff is rapid, and the hazard of further erosion is severe. Most of the acreage is wooded. Cleared areas are used mostly for pasture, hay, and cultivated crops. This soil is poorly suited to most cultivated crops. It is better suited to pasture. Capability unit VIe–2; woodland suitability group 10.

Louisa Series

The Louisa series consists of shallow, somewhat excessively drained soils that have a loamy, micaceous subsoil. These sloping to steep soils are adjacent to streams and large drainageways. They formed in the weathered products of quartz, mica schist, and mica gneiss.

In a representative profile, the surface layer, about 9 inches thick, is mainly brown fine sandy loam that contains some quartz fragments and many fine mica flakes. The subsoil, which extends to a depth of 14 inches, is light yellowish-brown fine gravelly loam that contains many mica flakes. The substratum is a mixture of yellow loam and weathered mica schist. Partly weathered mica schist is at a depth of 19 inches.

Louisa soils have a strongly acid to very strongly acid subsoil. They are low in natural fertility. Permeability is moderately rapid, and the available water capacity is very low.

Representative profile of Louisa fine sandy loam, 6 to 15 percent slopes, in a cutover woodland near junction of State Highways No. 619 and No. 693, 1 mile west of junction on State Highway No. 619, on north side of the road:

A1—0 to 2 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; very friable; many fine roots; 5 to 10 percent fine gravel; few fine mica flakes; strongly acid; abrupt, smooth boundary.

A2—2 to 9 inches, brown (10YR 5/3) fine sandy loam; weak, fine, granular structure; very friable; common fine roots; 5 to 10 percent fine gravel; many fine mica flakes; strongly acid; clear, smooth boundary.

B—9 to 14 inches, light yellowish-brown (10YR 6/4) fine gravelly loam; weak, fine, subangular blocky structure; very friable; few fine and medium roots; 20 to 25 percent fine gravel; many fine and medium mica flakes; strongly acid; clear, irregular boundary.

C—14 to 19 inches, yellow (10YR 7/6), micaceous, friable, loamy saprolite that shows original rock structure; massive; many fine quartz fragments; strongly acid.

R—19 inches, partly weathered, gray and brown, variegated mica schist.

The A2 horizon ranges from 2.5Y to 10YR in hue; its value is 5 to 7, and its chroma is 2 to 6. Texture ranges from gravelly sandy loam to fine sandy loam but is dominantly fine sandy loam. In the B horizon the hue ranges from 5YR to 10YR, the value from 5 to 7, and the chroma from 2 to 8. Texture ranges from gravelly sandy loam to loam. In places there is a thin, discontinuous Bt horizon less than 6 inches thick. The Bt horizon is heavy loam to sandy clay loam, and it has the same color range as the rest of the B horizon. The C horizon is typically gray, yellow, and brown, mottled saprolite that contains abundant mica flakes and many, fine quartz frag-

ments. The solum is less than 20 inches thick; it ranges from 10 to about 18 inches in thickness. Depth to mica schist ranges from 15 to about 20 inches. Few to many fine pebbles and many mica flakes are in the solum. Reaction ranges from strongly acid to very strongly acid.

Louisa soils are similar to the Grover and Louisburg soils. They differ from Grover soils because they are shallower, are excessively drained, and do not have a continuous Bt horizon. They are more shallow than the Louisburg soils also. Louisa soils commonly are near Grover, Madison, Pacolet, and Wedowee soils. They differ from those soils in that they are shallower, are excessively drained, and lack the continuous Bt horizon.

Louisa fine sandy loam, 6 to 15 percent slopes (LoD).—This rolling soil is on uplands. Slopes are mostly short and convex. This soil has the profile described as representative for the series.

Included with this soil in mapping were a few small areas of Grover soils, small areas of Gullied land, and some bedrock outcrops.

Runoff is medium, and the hazard of erosion is severe. Most of this soil is wooded. Cleared areas are used mostly for pasture. This soil is poorly suited to most cultivated crops. It is better suited to pasture or trees. Capability unit VIe–3; woodland suitability group 8.

Louisa fine sandy loam, 15 to 35 percent slopes (LoF).—This hilly soil is on uplands and generally is adjacent to streams and large drainageways. The profile of this soil is a few inches thinner, but in other respects it is similar to the one described as representative for the series.

Included with this soil in mapping were a few small areas that have bedrock outcrops, and small areas of Gullied land.

Runoff is rapid, and the hazard of erosion is very severe. Nearly all of the acreage is wooded. Cleared areas are used mostly for pasture. This soil is not suited to crops and is poorly suited to pasture. Capability unit VIIe–1; woodland suitability group 8.

Louisa and Louisburg soils, 15 to 25 percent slopes, severely eroded (LsE3).—This undifferentiated unit is made up of two soils that are closely associated on residual uplands in the central and western parts of the county. The Louisa soil occupies about 75 percent of the total acreage, and the Louisburg soil about 25 percent. Any given area, however, may consist of the Louisa soil, the Louisburg soil, or both soils. The Louisa soil generally occupies hill crests and the steeper side slopes. The Louisburg soil is smoother and less precipitous. Both soils have profiles that are similar to those described for their respective series, but they have lost most of their original surface layer through erosion and are shallower to bedrock. The two soils are similar in characteristics and in use and management.

Runoff is rapid and the hazard of further erosion is very severe.

Most of this mapping unit is wooded. Cleared areas are used for pasture. The soils are not suited to most cultivated crops, but they are suited to trees or to fescue grown for pasture. Capability unit VIIe–1; woodland suitability group 8.

Louisburg Series

The Louisburg series consists of well-drained to excessively drained, moderately deep soils that have a loamy subsoil. These soils formed in the weathered products of granite and granite gneiss. They are undulating to hilly and are on uplands.

In a representative profile, the surface layer is sandy loam 9 inches thick. It is dark grayish brown in the upper 2 inches and yellowish brown in the main part. This layer is 10 to 15 percent fine gravel. The subsoil, which extends to a depth of 19 inches, is brownish-yellow sandy loam that contains from 10 to 15 percent fine gravel. In places the subsoil contains thin, discontinuous layers of clay loam or sandy clay loam. The substratum is mottled yellow, brown, and gray sandy loam that is mixed with weathered rock fragments. Hard bedrock is at a depth of 34 inches.

Louisburg soils have a strongly acid to very strongly acid subsoil, and they are low in natural fertility. Permeability is rapid, and the available water capacity is low.

Representative profile of Louisburg sandy loam, 15 to 35 percent slopes, in cutover woodland, near Campbell County line along State Highway No. 40, 100 feet north of the road:

A1—0 to 2 inches, dark grayish-brown (10YR 4/2) sandy loam; weak, fine, granular structure; very friable; many fine and medium roots; 10 to 15 percent gravel; strongly acid; abrupt, smooth boundary.

A2—2 to 9 inches, yellowish-brown (10YR 5/4) sandy loam; weak, fine, granular structure; very friable; many fine and medium roots; 10 to 15 percent gravel; strongly acid; clear, wavy boundary.

B—9 to 19 inches, brownish-yellow (10YR 6/6) sandy loam; weak, fine, granular structure; very friable, slightly sticky, nonplastic; common fine and medium roots; 10 to 15 percent fine gravel; lower part contains thin, discontinuous, yellowish-brown (10YR 5/6), sandy clay loam lens; strongly acid; clear, irregular boundary.

C—19 to 34 inches, mottled yellow, brown, and gray sandy loam saprolite that shows original rock structure; friable, few medium roots; strongly acid.

R—34 inches, cracked and jointed, hard acid granite.

The A1 horizon ranges from very dark gray to dark brown. Cultivated fields have an Ap horizon that is commonly yellowish brown in color, but hue ranges from 5Y to 5YR, value from 4 to 7, and chroma from 1 to 4. The Ap horizon is dominantly sandy loam, but in some places it is gravelly sandy loam or fine sandy loam. The B horizon is dominantly brownish yellow or light yellowish brown in a hue that ranges from 2.5Y to 5YR and value and chroma that range from 4 to 6. In places the lower part of the B horizon is sandy clay loam to sandy clay, either in a continuous layer or in discontinuous or intermittent lenses. This finer textured layer commonly ranges from 2 to 4 inches in thickness. Depth to hard bedrock ranges from 24 to 48 inches. Content of coarse fragments is less than 35 percent, by volume, throughout the profile.

Louisburg soils are similar to the Louisa, Pinkston, and Wilkes soils. They differ from Pinkston soils in lacking the red colors in the subsoil. They have a coarser textured subsoil than the Wilkes soils, and they are deeper to bedrock than Louisa soils. Louisburg soils commonly occur near Appling, Cecil, and Louisa soils. They are more shallow to bedrock than the Appling and Cecil soils and have less clay in the subsoil.

Louisburg sandy loam, 4 to 10 percent slopes (LuC).—This soil is on uplands. Included with it in mapping were a few small areas where bedrock is at a depth of less than 20 inches. Also included are small areas of Wedowee soils and a few spots of rock outcrops.

Runoff is medium, and the erosion hazard is very severe where this Louisburg soil is cultivated. Nearly all of the soil is wooded. Cleared areas commonly are used for pasture. The soil is poorly suited to corn, soybeans, and alfalfa. It is fairly well suited to small grain, pasture, and

bright tobacco. Capability unit IVe–3; woodland suitability group 8.

Louisburg sandy loam, 10 to 15 percent slopes (LuD).—This soil is on uplands. Included with it in mapping were small areas where bedrock is at a depth of less than 20 inches and a few places where bedrock crops out.

Runoff is rapid, and the hazard of erosion is severe. Nearly all the acreage is wooded. Cleared areas are used for pasture. This soil is poorly suited to cultivated crops and is not commonly used for that purpose. If the soil is properly managed, pasture can be grown. Capability unit VIe–3; woodland suitability group 8.

Louisburg sandy loam, 15 to 35 percent slopes (LuF).—This soil has the profile described as representative for the series. It is on uplands near major drainageways and streams.

Included with this soil in mapping were a few small areas where bedrock is at a depth of less than 20 inches and some places where the bedrock crops out.

Runoff is rapid, and the hazard of erosion is very severe. This soil is commonly in forest, but a few cleared areas are used for pasture. The soil is not suited to cultivated crops, but pasture can be grown if management is good. Capability unit VIIe–1; woodland suitability group 8.

Madison Series

The Madison series consists of deep, well-drained, undulating to hilly soils on uplands. These soils formed in the weathered products of quartz, mica schist, and other rocks that contain mica.

In a representative profile, the surface layer is grayish-brown fine sandy loam about 8 inches thick. The subsoil extends to a depth of 42 inches. The upper 9 inches of the subsoil is strong-brown sandy clay loam; the next 20 inches is red heavy clay loam mottled with yellowish brown; and the lower 5 inches is red loam mottled with yellowish brown. The substratum is red and yellowish-brown loam that is mixed with strongly weathered, micaceous rocks. Hard bedrock occurs at a depth of 52 inches.

These soils have a strongly acid or very strongly acid subsoil and are low in natural fertility. Permeability is moderate, and the available water capacity is medium.

Representative profile of Madison fine sandy loam, 2 to 6 percent slopes, eroded, in cutover woodland one-half mile west of Turnip Creek, on the north side of State Highway No. 619:

Ap—0 to 8 inches, grayish-brown (10YR 5/2) fine sandy loam; weak, fine, granular structure; very friable; many fine roots; few fine pebbles; few fine mica flakes; strongly acid; abrupt, smooth boundary.

B1t—8 to 17 inches, strong-brown (7.5YR 5/8) heavy sandy clay loam; many, fine, distinct, light yellowish-brown (10YR 6/4) mottles; weak, fine, subangular blocky structure; friable; few fine and medium roots; few fine pebbles; few fine mica flakes; strongly acid; clear, wavy boundary.

B21t—17 to 30 inches, red (2.5YR 4/6) heavy clay loam; many, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; few medium roots; many fine and medium pores; many fine mica flakes; thin discontinuous clay films; strongly acid; clear, wavy boundary.

B22t—30 to 37 inches, red (2.5YR 5/8) heavy clay loam; few, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; few medium pores; thin discontinuous clay films; many fine mica flakes; strongly acid; clear, wavy boundary.

B3—37 to 42 inches, red (2.5YR 5/8) loam; many, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, angular blocky structure; friable, slightly sticky and slightly plastic; many fine mica flakes; strongly acid; clear, irregular boundary.

C—42 to 52 inches, red (2.5YR 4/8) and yellowish-brown (10YR 5/6), variegated loam saprolite; massive; shows original rock structure; micaceous; friable; strongly acid.

R—52 inches, hard mica schist.

The Ap horizon ranges from grayish brown to yellowish red. The A horizon is mostly fine sandy loam, but it is clay loam in severely eroded areas. Its content of fine gravel is 5 to 15 percent. The Bt horizon is generally red and ranges in hue from 5YR to 10R, in value from 4 to 6, and in chroma from 6 to 8. Its texture ranges from heavy clay loam to clay. Mica flakes are few to many in the upper part of the solum and many in the lower part. The C horizon is generally red, yellow, white, and brown, friable micaceous schist. The solum ranges from 30 to 48 inches in thickness. Depth to hard rock ranges from 4 to 8 feet or more. Reaction is strongly acid to very strongly acid.

Madison soils are similar to Cecil and Grover soils. They differ from Cecil soils in having many fine mica flakes in the lower part of the subsoil. In addition, they generally have a thinner solum than Cecil soils. Madison soils have a redder, more clayey Bt horizon than the Grover soils. Madison soils commonly occur near Cecil, Cullen, Grover, and Louisa soils. They differ from Cullen soils in that they lack the dark-red Bt subhorizon and have more mica in the lower part of the subsoil. Madison soils are deeper to bedrock and have more clay in the subsoil than the Louisa soils.

Madison fine sandy loam, 2 to 6 percent slopes, eroded (MaB2).—This undulating to gently sloping soil is on uplands. It has the profile described as representative for the series. The surface layer ranges from 6 to 8 inches in thickness.

Included with this soil in mapping were small areas of Abell soils at the heads of some drainageways and small areas of soils that have a yellowish-red clay loam surface layer.

Runoff is medium, and the hazard of further erosion is moderate if this soil is under good management. This soil is well suited to most crops grown locally. Capability unit IIe–4; woodland suitability group 4.

Madison fine sandy loam, 6 to 15 percent slopes, eroded (MaD2).—This rolling soil is on uplands. Slopes generally are slightly convex and medium to long. The profile of this soil is similar to the one described as representative for the series, but the surface layer ranges from 5 to 8 inches in thickness.

Included with this soil in mapping were small areas of severely eroded soils that have a yellowish-red clay loam surface layer and small areas where the surface layer is gravelly.

Runoff is medium to rapid, and the hazard of further erosion is severe. Most of the acreage is wooded. Cleared areas are used for pasture, hay, and cultivated crops. This soil is fairly well suited to cultivated crops. It is well suited to small grain, pasture, and hay. Capability unit IIIe–4; woodland suitability group 4.

Madison clay loam, 2 to 6 percent slopes, severely eroded (McB3).—This undulating to gently sloping soil is on uplands. Most slopes are medium in length and slightly convex. Most of the original surface layer and, in places, part of the subsoil have been removed by erosion, and the present surface layer is yellowish-red clay loam. In other

respects the profile of this soil is similar to the one described as representative for the series.

Included with this soil in mapping were small areas of soils that have a fine sandy loam surface layer and small areas of Alluvial land at the heads of some drainageways.

Runoff is medium, and the hazard of further erosion is severe where this soil is cultivated.

Most of the acreage is used for cultivated crops, hay, and pasture. This soil is not well suited to cultivated crops but is well suited to pasture. The soil has poor tilth in most places because the surface layer is sticky when wet and hard when dry. Capability unit IIIe–5; woodland suitability group 5.

Madison clay loam, 6 to 15 percent slopes, severely eroded (McD3).—This rolling soil is on uplands. Most slopes are medium long to long and slightly convex. Most of the original surface layer and, in places, part of the subsoil have been removed by erosion, and the surface layer now is yellowish-red clay loam. Otherwise, this soil has a profile similar to the one described as representative for the series.

Included with this soil in mapping were small areas of less severely eroded soils that have a fine sandy loam layer and small areas of Alluvial land that lie at the heads of some drainageways.

Runoff is rapid, and the hazard of further erosion is very severe. Most of the acreage is wooded. Cleared areas are used for cultivated crops, hay, and pasture. This soil is poorly suited to most cultivated crops, but it is fairly well suited to pasture. Capability unit VIe–1; woodland suitability group 5.

Madison and Grover fine sandy loams, 15 to 25 percent slopes, eroded (MdE2).—This is an undifferentiated unit of similar soils that are associated on uplands. About 60 percent of the total acreage is Madison fine sandy loam, and about 40 percent is Grover fine sandy loam. Areas mapped as these soils, however, may contain either the Madison soil or the Grover soil, or some of both. Where the two soils occur together, the Madison generally occupies the smoother, less precipitous parts of the landscape.

The profile of the Madison soil is similar to the one described as representative for the Madison series. Except that it is somewhat shallower to bedrock, the profile of the Grover soil is similar to the one described as representative for the Grover series.

Runoff is rapid on these soils, and fall-maturing crops are damaged from lack of water, especially in the steeper areas.

The surface layer is friable and easily tilled, but the soils are highly susceptible to further erosion if they are cultivated. Most areas of these soils are wooded. Cleared areas generally are in pasture. Fescue pasture and woodland are among the best uses for these soils. Capability unit IVe–1; woodland suitability group 4.

Masada Series

The Masada series consists of deep, well-drained soils that have a clayey layer in the subsoil. These soils formed in old alluvial deposits along the Roanoke River and other major streams. They are several feet higher in elevation than the flood plain and therefore are rarely or never flooded.

In a representative profile, the surface layer is fine sandy loam about 10 inches thick. It is dark gray in the upper 2 inches and light yellowish brown in the main part. This horizon is 15 to 20 percent fine gravel. The subsoil, which extends to a depth of 55 inches, ranges from yellowish brown or brownish yellow to yellowish red and is distinctly mottled at depths below 24 inches. Texture of the subsoil is clay loam to clay that generally contains some gravel. The substratum is mottled yellowish-brown, red, and light yellowish-brown clay loam that contains a few fine and medium pebbles.

Masada soils have a strongly acid to very strongly acid subsoil and are low in natural fertility. Permeability is moderate, and the available water capacity is medium.

Representative profile of Masada fine sandy loam, 2 to 6 percent slopes, eroded, located on Roanoke Plantation, one-fourth mile south of the main house and 200 feet west of the lane:

O2—½ inch to 0, black, partially decomposed organic materials.
A1—0 to 2 inches, dark-gray (10YR 4/1) fine sandy loam; weak, fine, granular structure; very friable; many fine roots; 15 to 20 percent fine gravel ¼ inch to 2 inches in diameter; strongly acid; abrupt, wavy boundary.
A2—2 to 10 inches, light yellowish-brown (2.5Y 6/4) fine sandy loam; weak, fine, granular structure; very friable; many fine and medium roots; 15 to 20 percent fine gravel ¼ inch to 2 inches in diameter; strongly acid; clear, wavy boundary.
B1t—10 to 15 inches, yellowish-brown (10YR 5/8) light clay loam; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; few medium roots; 5 to 10 percent fine gravel ¼ inch to 2 inches in diameter; very strongly acid; clear, wavy boundary.
B21t—15 to 25 inches, brownish-yellow (10YR 6/8) heavy clay loam; many, fine, faint, yellowish-brown (10YR 5/8) mottles; moderate, fine, subangular blocky structure; firm, sticky and plastic; few medium roots; common fine and medium pores; thin discontinuous clay films; 5 to 10 percent fine gravel; very strongly acid; clear, wavy boundary.
B22t—25 to 39 inches, yellowish-red (5YR 5/8) clay; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, fine, subangular blocky structure; firm, sticky and plastic; common fine pores; thin discontinuous clay films; very strongly acid; clear, wavy boundary.
B23t—39 to 50 inches, yellowish-brown (10YR 5/6) clay; many, medium, distinct, red (2.5YR 4/6) mottles; moderate, fine, subangular blocky structure; firm, sticky and plastic; common fine pores; thin discontinuous clay films; very strongly acid; gradual, wavy boundary.
B3t—50 to 55 inches, yellowish-brown (10YR 5/6) clay; many, medium, distinct, red (2.5YR 4/6) mottles; weak, fine, subangular blocky structure; firm, sticky and plastic; common fine pores; thin discontinuous clay films; very strongly acid; gradual, wavy boundary.
C—55 to 72 inches, yellowish-brown (10YR 5/6), red (2.5YR 4/6), and light yellowish-brown (2.5Y 6/4), variegated clay loam; massive; firm; slightly sticky and slightly plastic; 5 to 10 percent fine and medium pebbles; very strongly acid.

The A1 horizon ranges from very dark gray to dark grayish brown in color and from 1 to 3 inches in thickness. The A2 horizon ranges from light yellowish brown to brown. Texture of the A horizon is mostly fine sandy loam, but it ranges from sandy loam to gravelly sandy loam. The Bt horizon, in some parts, ranges from strong brown to yellowish red. In other parts, it may be brownish yellow to red and mottled. Texture of the B2t horizon ranges from heavy clay loam to clay. The B3 and C horizons are mottled brown, yellow, and red clay loam. The solum ranges from 40 to 70 inches in thickness. Depth to hard rock ranges from 4 to 10 feet or more. Reaction is strongly acid to very strongly acid.

Masada soils are similar to the Appling, Turbeville, and Wickham soils. They differ from the Appling soils in that they formed in old alluvial deposits, whereas the Appling soils formed in material weathered from rocks. Masada soils are less red and have a thinner solum than Turbeville soils. They have a finer textured subsoil and are less red than Wickham soils.

Masada soils commonly occur near Altavista, Appling, Turbeville, and Wickham soils. They are better drained and have more clay in the subsoil than Altavista soils.

Masada fine sandy loam, 2 to 6 percent slopes, eroded (MeB2).—This soil is on terraces that adjoin major streams and in colluvial areas near Red House. It has the profile described as representative for the series. The surface layer ranges from 7 to 13 inches in thickness.

Included with this soil in mapping were small areas of soils that have a gravelly surface layer.

Runoff is medium, and the hazard of further erosion is moderate if the soil is under good management. Most of the acreage is wooded. Cleared areas are used for pasture, hay, and cultivated crops. This soil is well suited to most crops grown locally. Capability unit IIe–1; woodland suitability group 4.

Masada fine sandy loam, 6 to 15 percent slopes, eroded (MeD2).—This soil is on terraces that adjoin major streams and in colluvial areas near Red House. Except that its surface layer is not so thick, the profile of this soil is similar to the one described as representative for the series. Generally the surface layer is less than 8 inches thick.

Included with this soil in mapping were small areas of soils that have a gravelly surface layer.

Runoff is medium to rapid, and the hazard of further erosion is severe. Most of the acreage is wooded. Cleared areas are used for pasture and hay. This soil is fairly well suited to most crops grown locally, but the steeper areas are poorly suited to cultivated crops. Capability unit IIIe–1; woodland suitability group 4.

Masada fine sandy loam, 15 to 25 percent slopes (MeE).—This hilly soil is on terraces that adjoin major streams. Slopes are medium in length and are slightly convex.

Included with this soil in mapping were small areas of soils that have a gravelly surface layer. Also included are small areas of Alluvial land in some of the drainageways.

Runoff is rapid, and the hazard of erosion is very severe. This soil is mostly wooded. Cleared areas are used mostly for pasture. This soil is poorly suited to most crops. It is suited to woodland or pasture. Capability unit IVe–1; woodland suitability group 4.

Mayodan Series

The Mayodan series consists of deep, well-drained soils that have a clayey layer in the subsoil. These soils formed in the weathered products of Triassic sedimentary rocks.

In a representative profile, the surface layer is sandy loam about 11 inches thick. The upper part is dark grayish brown, the middle part is yellowish brown, and the lower part is pale brown. The subsoil extends to a depth of 44 inches. The upper 8 inches of the subsoil is pale-brown clay mottled with yellowish red; the next 6 inches is yellowish-red clay mottled with yellowish brown; and the lower 19 inches is mottled, yellowish-brown clay loam. The substratum is mottled loam mixed with strongly weathered rock. Hard bedrock is at a depth of 52 inches.

These soils have a strongly acid to very strongly acid subsoil and are low in natural fertility. They have moderate permeability and medium available water capacity.

Representative profile of Mayodan sandy loam 2 to 6 percent slopes, eroded, in a field planted to pines, one-fourth mile west of Roanake Creek on State Highway No. 619, on north side of the road:

A1—0 to 2 inches, dark grayish-brown (10YR 4/2) sandy loam; weak, fine, granular structure; very friable; few fine pebbles; abundant fine roots; strongly acid; abrupt, smooth boundary.

A2—2 to 8 inches, yellowish-brown (10YR 5/4) sandy loam; weak, fine, granular structure; very friable; 5 to 10 percent fine gravel; few fine roots; strongly acid; clear, wavy boundary.

A3—8 to 11 inches, pale-brown (10YR 6/3) fine gravelly sandy loam; many, fine, distinct, reddish-yellow (7.5YR 6/6) mottles; weak, fine, granular structure; very friable; 20 to 25 percent fine gravel; few medium roots; strongly acid; clear, wavy boundary.

B21t—11 to 19 inches, pale-brown (10YR 6/3) clay; many, fine, distinct, yellowish-red (5YR 5/6) mottles; moderate, fine, subangular blocky structure; firm, sticky and plastic; thin discontinuous clay films; 5 to 10 percent fine gravel; very strongly acid; clear, wavy boundary.

B22t—19 to 25 inches, yellowish-red (5YR 5/8) clay; many, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, fine, subangular blocky structure; firm, sticky and plastic; thin discontinuous clay films; 5 to 10 percent fine gravel; few fine mica flakes; very strongly acid; clear, irregular boundary.

B3—25 to 44 inches, yellowish-brown (10YR 5/6) clay loam; many, medium, prominent, dark reddish-brown (2.5YR 3/4) mottles; moderate, medium, angular blocky structure; friable, slightly sticky and slightly plastic; thin discontinuous clay films; 5 to 10 percent fine gravel; common fine mica flakes; very strongly acid; gradual, irregular boundary.

C—44 to 52 inches, white, weak-red, and brown, variegated loam saprolite that shows original rock structure; very strongly acid; weathered from sedimentary conglomerates.

R—52 inches, hard sedimentary conglomerates.

The A horizon is mainly sandy loam but in places is fine sandy loam. The B2t horizon is 35 to 45 percent clay. Hue in this horizon is 5YR or yellower; normally it is 5YR or 7.5YR, value is 4 to 6, and chroma is 3 to 8. The B2t horizon is typically heavy clay loam or clay. Its thickness ranges from about 12 to 18 inches, and moist consistence is firm to friable. The solum ranges from 30 to 60 inches in thickness. Depth to bedrock generally is more than 48 inches; but the depth ranges to more than 72 inches. Reaction ranges from very strongly acid to strongly acid. These soils have a high content of exchangeable aluminum.

Mayodan soils are similar to the Appling and Vance soils. They differ from these soils in having a higher content of exchangeable aluminum. They have a more permeable Bt horizon than Vance soils.

Mayodan soils commonly occur near Appling, Creedmoor, Pinkston, and Vance soils. They lack the gray mottles in the B2t horizon that Creedmoor soils have and are better drained. Mayodan soils are deeper to bedrock than the Pinkston soils, and they have more clay in the subsoil.

Mayodan sandy loam, 2 to 6 percent slopes, eroded (MfB2).—This undulating to gently sloping soil is in areas adjacent to Roanoke Creek. It has the profile described as representative for the series. The surface layer generally is less than 8 inches thick but ranges from 6 to 12 inches in thickness.

Included with this soil in mapping were small areas of Creedmoor sandy loam, 2 to 6 percent slopes, eroded.

Runoff is medium, and the hazard of further erosion is moderate where this soil is cultivated. Most of the acreage is wooded. Cleared areas are used for cultivated crops,

pasture, or hay. This soil is well suited to most of the crops grown locally. Capability unit IIe–1; woodland suitability group 4.

Mayodan sandy loam, 6 to 15 percent slopes, eroded (MfD2).—This rolling to strongly sloping soil is in areas adjacent to Roanoke Creek. It has a profile similar to the one described as representative for the series, but the surface layer ranges from 5 to 8 inches in thickness. Slopes are mostly medium in length and slightly convex.

Included with this soil in mapping were small areas of steep Pinkston soils and small areas of soils that are severely eroded and have a clay loam surface layer.

Runoff is medium to rapid, and the hazard of further erosion is severe. Most of the acreage is wooded. Cleared areas are used for pasture and hay. This soil is fairly well suited to small grain, hay, and pasture. Capability unit IIIe–1; woodland suitability group 4.

Mecklenburg Series

The Mecklenburg series consists of deep, well-drained soils that formed in the weathered products of fine-grained basic rocks.

In a representative profile, the surface layer is brown loam 8 inches thick. The subsoil extends to a depth of 36 inches. The upper 5 inches of the subsoil is yellowish-red clay loam; the next 15 inches is yellowish-red firm clay; and the lower 8 inches is distinctly mottled, red clay loam. The substratum is mottled clay loam mixed with strongly weathered basic rocks. Hard bedrock occurs at a depth of 52 inches.

These soils have a slightly acid to neutral subsoil and are medium in natural fertility. They have slow permeability and medium available water capacity.

Representative profile of Mecklenburg loam, 2 to 6 percent slopes, eroded, in a pasture near Madisonville on State Highway No. 47, at the junction of State Highways No. 699 and No. 47, 100 yards southwest of the junction:

Ap—0 to 8 inches, brown (7.5YR 5/4) loam; weak, fine, granular structure; very friable; many fine roots; 5 to 10 percent fine gravel; slightly acid; abrupt, smooth boundary.

B1t—8 to 13 inches, yellowish-red (5YR 4/6) clay loam; many, fine, faint, reddish-brown (2.5YR 4/4) mottles; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; few fine gravel; few medium and fine roots; slightly acid; clear, wavy boundary.

B21t—13 to 21 inches, yellowish-red (5YR 4/6) clay; many, fine, faint, strong-brown (7.5YR 5/6) mottles; moderate, fine, subangular blocky structure; firm, sticky and plastic; thin discontinuous clay films; slightly acid; clear, wavy boundary.

B22t—21 to 28 inches, yellowish-red (5YR 4/6) clay; many, fine, faint, red (2.5YR 4/6) mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; thin discontinuous clay films; 5 to 10 percent fine gravel; slightly acid; clear, wavy boundary.

B3t—28 to 36 inches, red (2.5YR 4/6) clay loam; many, fine, distinct, strong-brown (7.5YR 5/6) mottles; moderate, fine, subangular blocky structure; friable, sticky and plastic; 15 to 20 percent fine gravel; thin discontinuous clay films; few fine concretions; slightly acid; clear, irregular boundary.

C—36 to 52 inches, mottled yellowish-red and yellowish-brown clay loam that is mixed with dark-colored and white saprolite; weathered rocks contain many basic minerals; reaction is about neutral.

R—52 inches, hard hornblende schist bedrock.

Hue of the A horizon ranges from 2.5YR to 7.5YR; value is 4 or 5, and chroma is 2 to 6. The texture ranges from sandy loam to clay loam but is mainly loam. In the Bt horizon the hue is 2.5YR to 5YR; value is 4 to 6, and chroma is 3 to 8. Texture of the B2t horizon is clay. The solum ranges from 20 to 40 inches in thickness. Depth to bedrock is 3 to 5 feet. A few pebbles and fine concretions commonly occur throughout the solum. Reaction ranges from slightly acid in the upper part of the subsoil to neutral in the lower part.

Mecklenburg soils are similar to the Cullen and Enon soils. They are less acid than Cullen soils. They do not have the dark-red color in some parts of the subsoil that Cullen soils have. They are redder than Enon soils. Mecklenburg soils commonly occur near Enon, Iredell, and Wilkes soils. They are redder and better drained than the Iredell soils and are deeper to bedrock than the Wilkes soils.

Mecklenburg loam, 2 to 6 percent slopes, eroded (MkB2).—This undulating to gently sloping soil is on uplands. It has the profile described as representative for the series. Slopes are mostly short and slightly convex. The surface layer ranges from 5 to 9 inches in thickness.

Included with this soil in mapping were small areas of Starr soils at the heads of some drainageways. Also included were small areas of soils that are severely eroded and that have a clay loam or clay surface layer.

Runoff is medium, and the hazard of further erosion is moderate if the soil is properly managed. Most of this soil is wooded. Cleared areas are used for cultivated crops, pasture, or hay. This soil is well suited to most crops grown locally. Capability unit IIe–2; woodland suitability group 6.

Mecklenburg loam, 6 to 12 percent slopes, eroded (MkC2).—This rolling to strongly sloping soil is on uplands. The profile of this soil is similar to the one described as representative for the series, but it is slightly thinner. Slopes are mostly short and slightly convex. The surface layer ranges from 4 to 7 inches in thickness.

Included with this soil in mapping were small areas of soils that are severely eroded and have a surface layer of clay loam or clay. Also included were small areas of Starr soils at the heads of some drainageways.

Runoff is medium to rapid, and the hazard of further erosion is severe. This soil is fairly well suited to most crops grown locally. Capability unit IIIe–3; woodland suitability group 6.

Mecklenburg Series, Loamy Subsoil Variant

The Mecklenburg series, loamy subsoil variant, consists of moderately deep to deep, well-drained soils that have a loamy subsoil. These soils are undulating to hilly and are on uplands. They formed in residuum from mixed acidic and basic rocks.

In a representative profile, the surface layer is reddish-brown loam 8 inches thick. This layer is as much as 20 percent fine pebbles. The subsoil is red light clay loam that contains some fine pebbles, and it extends to a depth of about 25 inches. The substratum is red and yellowish-red light clay loam mixed with strongly weathered, dark-colored rocks. Hard bedrock occurs at a depth of 36 inches.

These soils have a medium acid to slightly acid subsoil and are medium in natural fertility. Permeability is moderate, and the available water capacity is low to medium.

Representative profile of Mecklenburg loam, loamy subsoil variant, 6 to 10 percent slopes, in a pasture one-half

mile west of junction of State Highways No. 691 and No. 701, on the west side of Big Cub Creek and the south side of the road:

Ap—0 to 8 inches, reddish-brown (5YR 4/4) loam; weak, fine, granular structure; very friable; 15 to 20 percent fine gravel; many fine roots; slightly acid; abrupt, smooth boundary.

B21t—8 to 20 inches, red (2.5YR 4/6) light clay loam; many, fine, distinct, reddish-brown (5YR 4/4) mottles; moderate, fine, subangular blocky structure; friable, sticky and plastic; thin discontinuous clay films; 5 to 10 percent fine gravel; common fine and medium roots; slightly acid; clear, wavy boundary.

B22t—20 to 25 inches, red (2.5YR 4/6) light clay loam; moderate, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; thin discontinuous clay films; 15 to 20 percent fine to medium gravel; few fine and medium roots; slightly acid; clear, irregular boundary.

C—25 to 36 inches, mottled red (2.5YR 4/6) and yellowish-red (5YR 4/6) saprolite; light clay loam mixed with weathered rock material; many, coarse, dark-colored rock fragments that show the original rock structure; friable; slightly acid.

R—36 inches, hard, hornblende schist bedrock.

The A horizon ranges from reddish brown to dark grayish brown in color and from fine sandy loam to loam in texture. The Bt horizon ranges from dark red to yellowish red, and its texture is heavy loam to light clay loam. The C horizon ranges from gravelly loam to clay loam. The solum ranges from 12 to 26 inches in thickness. Depth to hard rock is 2 to 5 feet. Reaction is medium acid to slightly acid.

Mecklenburg, loamy subsoil variant, soils are similar to normal Mecklenburg soils and to the Wilkes soils. They differ from normal Mecklenburg soils in having a loamy instead of clayey subsoil, and their solum is not so thick. They are redder than the Wilkes soils and have a thicker B2t horizon.

Mecklenburg, loamy subsoil variant, soils commonly are near normal Mecklenburg soils, as well as Wilkes and Enon soils. They differ from Enon soils in having a less clayey subsoil and a thinner Bt horizon.

Mecklenburg loam, loamy subsoil variant, 2 to 6 percent slopes (MlB).—This soil is on narrow ridges in the uplands. Slopes are mostly short and convex.

Included with this soil in mapping were small areas of Wilkes soils and of soils that have a gravelly loam surface layer.

Runoff is medium to slow, and the hazard of erosion is severe where this soil is cultivated. Most of the acreage is wooded. Cleared areas are used mostly for pasture. This soil is fairly well suited to most crops grown locally. Capability unit IIIe–4; woodland suitability group 6.

Mecklenburg loam, loamy subsoil variant, 6 to 10 percent slopes (MlC).—This rolling and strongly sloping soil is on uplands. It has the profile described as representative for the series. Slopes are mostly short and convex.

Included with this soil in mapping were small areas of Wilkes soils and of soils that have a gravelly loam surface layer.

Runoff is medium to rapid, and the hazard of erosion is severe. Most of the acreage is wooded. Cleared areas are used mostly for pasture. This soil is poorly suited to cultivated crops but is fairly well suited to small grain and pasture. Capability unit IVe–1; woodland suitability group 6.

Mecklenburg loam, loamy subsoil variant, 10 to 25 percent slopes (MlE).—This soil is in areas adjacent to major waterways and streams.

Included with this soil in mapping were a few areas of soils that have a surface layer of fine sandy loam or gravelly loam. Small inclusions of Wilkes soils also occur in some places.

Runoff is rapid, and the hazard of erosion is severe.

Nearly all of the acreage is wooded. Cleared areas are used for pasture. This soil is poorly suited to cultivated crops and is not commonly used for that purpose. Under good management, fescue pasture grows fairly well. Capability unit VIe–3; woodland suitability group 6.

Mecklenburg loam, loamy subsoil variant, 10 to 25 percent slopes, severely eroded (MlE3).—This soil occurs adjacent to major drainageways and streams. It has a severely eroded surface layer, but in other respects its profile is similar to the one described as representative for the series.

Included with this soil in mapping were areas of Wilkes soils and areas of soils that have a surface layer of gravelly loam or fine sandy loam.

Runoff is rapid, and the hazard of erosion is severe. Most of the acreage is now wooded or has been planted to pines. Cleared areas are used for pasture. This soil is not suited to cultivated crops. A good use is for fescue pasture or woodland. Capability unit VIe–3; woodland suitability group 5.

Orange Series

The Orange series consists of deep, somewhat poorly drained to moderately well drained soils that have a very plastic, clayey layer in the subsoil. These soils are undulating to rolling and are on uplands. They formed in material weathered from greenstone, slate, and other fine-grained basic rocks.

In a representative profile, the surface layer is light olive-brown silt loam about 14 inches thick. The subsoil, which extends to a depth of 48 inches, is mottled, yellowish-brown to light olive-brown clay in the upper part and mottled, olive silt loam in the lower part. The substratum is mottled silt loam mixed with strongly weathered rock fragments.

These soils have a medium acid to neutral subsoil and are low to medium in natural fertility. Permeability is slow, and the available water capacity is medium.

Representative profile of Orange silt loam, 2 to 6 percent slopes, under a stand of planted pines 200 feet northwest of U.S. Highway Nos. 360 and 15, on State Highway No. 626, east of the road:

Ap—0 to 9 inches, light olive-brown (2.5Y 5/4) silt loam; weak, fine, granular structure; very friable; few fine roots; 5 to 10 percent fine gravel ½ inch to 2 inches in diameter; medium acid; abrupt, smooth boundary.

A3—9 to 14 inches, light olive-brown (2.5Y 5/4) heavy silt loam; many, medium, distinct, yellow (10YR 7/8) mottles; weak, fine, subangular blocky structure; very friable, slightly sticky and slightly plastic; few fine and medium roots; 5 to 10 percent fine gravel; medium acid; clear, wavy boundary.

B21t—14 to 21 inches, yellowish-brown (10YR 5/6) clay; few, fine, distinct, grayish-brown (2.5Y 5/2) and light olive-brown (2.5Y 5/4) mottles; moderate, medium, angular blocky structure; firm, sticky and plastic; few fine pores; thin patchy clay films; medium acid; clear, wavy boundary.

B22t—21 to 30 inches, light olive-brown (2.5Y 5/4) clay; weak, coarse, angular blocky structure; very firm, very sticky and very plastic; thin discontinuous clay films; medium acid; clear, wavy boundary.

B23t—30 to 34 inches, yellowish-brown (10YR 5/4) clay; many, medium, distinct, gray (10YR 5/1) and olive (5Y 5/4) mottles; weak, coarse, angular blocky structure; very firm, very sticky and very plastic; thin discontinuous clay films; medium acid; clear, wavy boundary.

B24t—34 to 37 inches, yellowish-brown (10YR 5/6) clay; many, medium, distinct, olive-yellow (2.5Y 6/6) and white (2.5Y 8/2) mottles; weak, coarse, angular blocky structure; massive; very firm, very sticky and very plastic; thin patchy clay films; medium acid; clear, wavy boundary.

B3t—37 to 48 inches, olive (5Y 5/4) silt loam; many, fine, distinct, white (2.5Y 8/2) and pale-yellow (2.5Y 7/4) mottles; weak, coarse, angular blocky structure; firm, sticky and plastic; thin patchy clay films; slightly acid; clear, irregular boundary.

C—48 to 60 inches, white (2.5Y 8/2), pale-yellow (2.5Y 7/4), and yellowish-brown (10YR 5/4), variegated silt loam saprolite; massive; shows original rock structure; friable, slightly sticky and slightly plastic; neutral to mildly alkaline.

The A horizon is pale olive to light yellowish brown, and it commonly is 5 to 15 percent fine gravel. The Bt horizon has a hue of 10YR or yellower, a value of 4 or 5, and a chroma of 1 to 6. Consistence of the B2t horizon is very firm and is very sticky and very plastic. The texture of this horizon is clay, and the content of clay ranges from 50 to 60 percent. The solum ranges from 30 to 55 inches in thickness. Depth to hard rock ranges from 40 to 60 inches or more. Reaction is medium acid to neutral in the lower part of the Bt horizon.

Orange soils are similar to Creedmoor, Helena, Iredell, and Vance soils. They are less acid than Creedmoor, Helena, and Vance soils. They differ from the Iredell soils in having low-chroma mottles in the upper 10 inches of the Bt horizon.

Orange soils commonly are near Iredell, Georgeville, Herndon, and Worsham soils. They are more poorly drained than the Herndon and Georgeville soils and are better drained than the Worsham soils.

Orange silt loam, 2 to 6 percent slopes (OrB).—This soil in on broad ridges in the uplands. It has the profile described as representative for the series.

Included with this soil in mapping were small areas where bedrock is at a depth of less than 30 inches. Also included were small areas of Worsham soils that occur at the heads of some drainageways.

Runoff is medium to slow, and the hazard of erosion is severe where this soil is cultivated. This soil is fairly well suited to most crops grown locally. It is not well suited to alfalfa and tobacco. Capability unit IIIe–2; woodland suitability group 10.

Orange silt loam, 2 to 6 percent slopes, eroded (OrB2).—This soil is on broad ridges in the uplands. The surface layer is not so thick, but in other respects the profile of this soil is similar to the one described as representative for the series. Generally, the surface layer is less than 7 inches thick. Slopes are mostly medium in length and slightly convex.

Included with this soil in mapping were small areas where bedrock is at a depth of less than 30 inches. Also included were small areas of Worsham soils that occur at the heads of some drainageways.

Runoff is medium, and the hazard of further erosion is very severe where this soil is cultivated. The soil is fairly well suited to most crops grown locally, except alfalfa and tobacco. It is better suited to fescue grown for pasture. Capability unit IVe–2; woodland suitability group 10.

Orange silt loam, 6 to 10 percent slopes, eroded (OrC2).—This soil is on uplands. Slopes are mostly short and plane. The surface layer is not so thick, but in other respects this soil has a profile similar to the one described as representative for the series. Generally, the surface layer is less than 7 inches thick.

Included with this soil in mapping were small areas where bedrock is at a depth of less than 30 inches. Also included were small areas of Worsham soils that occur at the heads of some drainageways.

Runoff is medium to rapid, and the hazard of further erosion is severe. Most of the acreage is wooded. Cleared areas are used for pasture and hay. This soil is poorly suited to most crops. It is better suited to fescue grown for pasture. Capability unit VIe–2; woodland suitability group 10.

Pacolet Series

The Pacolet series consists of deep, well-drained, undulating to hilly soils that have a clayey layer in the subsoil. These soils formed on uplands in the weathered products of acid granite, gneiss, and schist.

In a representative profile, the surface layer is brown fine sandy loam about 7 inches thick. The subsoil extends to a depth of 31 inches. In the upper 5 inches the subsoil is red sandy clay loam; the next 15 inches is red clay; and the lower 4 inches is red clay loam mottled with yellowish brown. The substratum is mottled clay loam mixed with strongly weathered rock fragments. Hard bedrock occurs at a depth of 58 inches.

Pacolet soils have a strongly acid or very strongly acid subsoil and are low in natural fertility. Permeability is moderate, and the available water capacity is medium.

Representative profile of Pacolet fine sandy loam, 2 to 6 percent slopes, eroded, in a forest of oak and pine near Harrisburg, on State Highway No. 619, one-fourth mile west of Wallace Branch, on north side of the road:

Ap—0 to 7 inches, brown (10YR 5/3) fine sandy loam; many, fine, distinct, strong-brown (7.5YR 5/6) and dark-brown (10YR 3/3) mottles; weak, fine, subangular blocky structure; very friable; many fine roots; 5 to 10 percent fine gravel; strongly acid; abrupt, smooth boundary.

B1t—7 to 12 inches, red (2.5YR 4/6) sandy clay loam; many, fine, distinct, yellowish-red (5YR 5/8) mottles; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; 5 to 10 percent fine gravel; few medium and fine roots; strongly acid; clear, smooth boundary.

B2t—12 to 27 inches, red (2.5YR 5/8) clay; moderate, medium, subangular blocky structure; firm, sticky and plastic; few fine mica flakes; thin discontinuous clay films; few medium roots; strongly acid; clear, wavy boundary.

B3t—27 to 31 inches, red (2.5YR 5/8) clay loam; many, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; friable, sticky and plastic; thin discontinuous clay films; few fine mica flakes; 5 to 10 percent fine gravel; strongly acid; clear, wavy boundary.

C—31 to 58 inches, mottled yellowish-red, red, and yellowish-brown, strongly acid clay loam saprolite; massive; shows original rock structure; few fine mica flakes.

R—58 inches, hard, acid schist bedrock.

In the A horizon, hue ranges from 2.5Y to 10YR, value from 4 to 6, and chroma from 2 to 6. Texture is dominantly fine sandy loam, but it is sandy loam in places. In the B2t horizon, hue ranges from 2.5YR to 10R, value is 4 to 6, and chroma is 6 to 8. The texture ranges from heavy clay loam to clay. Thickness of the B2t horizon is 10 to 18 inches. The solum ranges from 24 inches to 40 inches in thickness, and depth to bedrock ranges from 4 to about 10 feet. A few fine mica flakes

and a few fine pebbles commonly occur throughout the solum. Reaction is strongly acid to very strongly acid.

Pacolet soils are similar to the Appling, Cecil, and Wedowee soils. They differ from the Appling and Cecil soils in having a B2t horizon that is less than 18 inches thick. They have a redder subsoil than Appling and Wedowee soils.

Pacolet soils commonly occur near Appling, Cecil, Louisburg, and Wedowee soils. They are deeper to bedrock than the Louisburg soils and have more clay in the subsoil.

Pacolet fine sandy loam, 2 to 6 percent slopes, eroded (PaB2).—This undulating to gently sloping soil is on uplands. It has the profile described as representative for the series. Slopes are mostly short and convex.

Included with this soil in mapping were small areas of Abell soils at the heads of some drainageways. Also included were small areas of soils where the surface layer is yellowish-red clay loam.

Runoff is medium to slow, and the hazard of further erosion is moderate if the soil is cultivated. Most of the acreage is wooded. Cleared areas are used for pasture, hay, and cultivated crops. This soil is well suited to most crops grown locally. Capability unit IIe–4; woodland suitability group 4.

Pacolet fine sandy loam, 6 to 15 percent slopes, eroded (PaD2).—This rolling and strongly sloping soil is on uplands. It has a profile similar to the one described as representative for the series, but the profile is a few inches thinner. Slopes are medium in length and slightly convex.

Included with this soil in mapping were small areas of soils that have a surface layer of yellowish-red clay loam. Also included were small areas of Abell soils at the heads of some drainageways.

Runoff is medium to rapid, and the hazard of further erosion is moderate to severe. Most of this soil is wooded. Cleared areas are used mostly for pasture and hay. This soil is only fairly well suited to most crops grown locally, but it is suited to pasture and hay crops. Capability unit IIIe–4; woodland suitability group 4.

Pacolet fine sandy loam, 15 to 25 percent slopes, eroded (PaE2).—This hilly to steep soil is in areas that adjoin streams or large drainageways. Its profile is a few inches thinner, but in other respects it is similar to the one described as representative for the series. Slopes are plane or slightly convex.

Included with this soil in mapping were small areas of Louisburg soils. Also included were small areas where the surface layer is yellowish-red clay loam.

Runoff is rapid, and the hazard of further erosion is very severe. Most of the acreage is wooded. Cleared areas are used mostly for pasture and hay. This soil is poorly suited to cultivated crops. It is suited to trees or pasture. Capability unit IVe–1; woodland suitability group 4.

Pacolet clay loam, 4 to 10 percent slopes, severely eroded (PcC3).—This undulating to sloping soil is on uplands. Its profile is similar to the one described as representative for the series, except that it is a few inches thinner because most of the original surface layer and, in places, part of the subsoil have been removed through erosion. The present surface layer is yellowish-red clay loam.

Included with this soil in mapping were areas of Alluvial land at the heads of some drainageways. Also included were small areas of Gullied land.

Runoff is medium to rapid, and the hazard of further erosion is very severe. Most of this soil is now wooded. Cleared areas are used for cultivated crops, hay, and pasture. This soil is poorly suited to cultivated crops. It is fairly well suited to small grain, hay, and pasture. Capability unit IVe–1; woodland suitability group 5.

Pacolet clay loam, 10 to 15 percent slopes, severely eroded (PcD3).—This soil is on uplands. Most of the original surface layer and, in places, part of the subsoil have been removed through erosion, and the present surface layer is yellowish-red clay loam. The profile is slightly thinner than the one described as representative for the series.

Included with this soil in mapping were small areas of Alluvial land at the heads of some drainageways. Also included were small areas of Gullied land.

Runoff is rapid, and the hazard of further erosion is very severe. Most of this soil is now wooded. Cleared areas are used mostly for pasture. This soil is poorly suited to cultivated crops or small grain. It is better suited to fescue grown for pasture. Capability unit VIe–1; woodland suitability group 5.

Pinkston Series

The Pinkston series consists of moderately deep, excessively drained to well-drained, sloping to hilly soils on uplands. These soils formed in the weathered products of Triassic sedimentary rocks.

In a representative profile, the surface layer is fine sandy loam 8 inches thick. It is dark gray in the upper 2 inches and weak red in the main part. The subsoil is weak-red to dark reddish-gray loam that extends to a depth of 19 inches. Small rock fragments are throughout the profile. The substratum is mottled yellowish-brown, reddish-brown, pink, and purple loam. It is mixed with weathered sandstone and conglomerate. Partially weathered bedrock is at a depth of 26 inches.

These soils have a strongly acid to very strongly acid subsoil, and they are low in natural fertility. Permeability is moderately rapid, and the available water capacity is low.

Representative profile of Pinkston fine sandy loam, 10 to 25 percent slopes, in woodland near U.S. Highway No. 40 and Roanoke Creek bridge, 100 yards northeast of the bridge:

O1—1½ inches to 1 inch, mixture of undecomposed leaves and twigs of deciduous trees.

O2—1 inch to 0, black to very dark brown, partially decomposed organic material.

A1—0 to 2 inches, dark-gray (5YR 4/1) fine sandy loam; weak, fine, granular structure; very friable; many fine roots; 5 to 10 percent gravel; strongly acid; abrupt, smooth boundary.

A2—2 to 8 inches, weak-red (2.5YR 4/2) fine sandy loam; weak, fine, granular structure; very friable; 5 to 10 percent coarse fragments, by volume; common fine roots; very strongly acid; clear, smooth boundary.

B—8 to 19 inches, weak-red (2.5YR 4/2) to dark reddish-gray (5YR 4/2) loam interrupted by irregularly shaped areas of silty clay loam; reddish brown (5YR 4/3) crushed; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; common fine mica flakes; 10 to 20 percent coarse fragments, by volume; very strongly acid; clear, irregular boundary.

C—19 to 26 inches, mottled yellowish-brown (10YR 5/6), reddish-brown (5YR 4/3), pink (7.5YR 7/4), and purple weathered sandstone and conglomerate that easily crushes to loam; contains few thin lenses of material that has a higher content of clay; reddish-brown color

becomes more dominant with increased depth; shows original rock structure; strongly acid; diffuse, irregular boundary.

R—26 inches, partially weathered sandstone and conglomerate.

The A2 horizon ranges from 4 to 8 inches in thickness. The A horizon has a hue of 5YR, 2.5YR, or 7.5YR and is fine sandy loam, very fine sandy loam, or loam. The B horizon ranges from 10 to 16 inches in thickness and from loam to fine sandy loam. Within the B horizon there are thin, discontinuous Bt layers that are more clayey. These layers are silty clay loam, clay loam, or sandy clay loam and have a content of clay ranging from 18 to 40 percent. The B horizon has a hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 2 to 6. Reaction in the B horizon is very strongly acid to strongly acid. Depth to bedrock ranges from 20 to 36 inches. Content of coarse fragments generally is less than 20 percent but ranges from 10 to 35 percent in the control section. These are small fragments of weathered sandstone and conglomerate.

Pinkston soils are similar to the Louisa and Louisburg soils. They are deeper than Louisa soils and lack the high mica flake content of those soils. They have a redder subsoil than Louisburg soils.

Pinkston soils commonly occur near Creedmoor and Mayodan soils. They have a thinner, less clayey subsoil and are shallower to bedrock than Creedmoor and Mayodan soils.

Pinkston fine sandy loam, 6 to 10 percent slopes (PkC).—This soil is in areas adjacent to Roanoke Creek in the central part of the county.

Included with this soil in mapping were small areas of soils that are very gravelly throughout the profile.

Runoff is medium to rapid, and the hazard of erosion is moderate to severe. Nearly all of the acreage is wooded. A few cleared areas are used for pasture. This soil is poorly suited to most crops, very poorly suited to tobacco, and only fairly well suited to fescue. Capability unit IVe–3; woodland suitability group 8.

Pinkston fine sandy loam, 10 to 25 percent slopes (PkE).—This soil is on side slopes along Roanoke Creek. It has the profile described as representative for the series.

Included with this soil in mapping were a few gravelly areas and small eroded areas.

Runoff is rapid, and the hazard of erosion is severe. Nearly all of the acreage is wooded, but there are a few cleared areas that are used for pasture. The soil is not suited to cultivated crops. Fescue can be grown if the soil is carefully managed. Capability unit VIe–3; woodland suitability group 8.

Roanoke Series

The Roanoke series consists of deep, poorly drained, nearly level soils that have a gray mottled, mainly clayey subsoil. These soils are on low alluvial terraces along major streams.

In a representative profile, the surface layer is dark grayish-brown silt loam 6 inches thick. The subsoil is mainly gray clay mottled with yellowish brown. It extends to a depth of 59 inches. The substratum is a gray, mottled loam.

Roanoke soils have a medium acid to strongly acid subsoil. They are low in natural fertility. Permeability, runoff, and internal drainage are slow. The available water capacity is medium.

Representative profile of Roanoke silt loam, in a pasture 2 miles southeast of Randolph on the Roanoke River terrace on Moratock Plantation, one-half mile south of the main house:

Ap—0 to 6 inches, dark grayish-brown (2.5Y 4/2) silt loam; many, fine, distinct, dark-brown (7.5YR 4/4) and gray (10YR 5/1) mottles; weak, fine, granular structure; very friable; many fine roots; medium acid; abrupt, smooth boundary.

B1tg—6 to 16 inches, gray (10YR 5/1) heavy silty clay loam; many, fine, distinct, dark reddish-brown (5YR 3/3) and yellowish-brown (10YR 5/4) mottles; moderate, fine, subangular blocky structure; friable, sticky and plastic; few fine and medium roots; many fine pores; few thin clay films; strongly acid; clear, wavy boundary.

B21tg—16 to 31 inches, gray (10YR 5/1) clay; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, angular blocky structure; very firm, very sticky and very plastic; few medium roots; few fine pores; common thin clay films; few fine mica flakes; strongly acid; gradual, wavy boundary.

B22tg—31 to 51 inches, gray (10YR 5/1) clay; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, angular blocky structure; very firm, very sticky and very plastic; very few fine pores; few fine mica flakes; strongly acid; gradual, wavy boundary.

B3tg—51 to 59 inches, gray (N 5/0) clay; many, medium, distinct, light olive-brown (2.5Y 5/4) and yellowish-brown (10YR 4/4) mottles; weak, coarse, angular blocky structure; very firm, very sticky and very plastic; few fine mica flakes; medium acid; clear, smooth boundary.

IICg—59 to 66 inches, gray (N 5/0) loam; many, medium, distinct, light olive-brown (2.5Y 5/4) and dark yellowish-brown (10YR 4/4) mottles; massive; very firm, very sticky and very plastic; 10 to 15 percent pebbles one-fourth inch in diameter; neutral.

The Ap horizon has a hue of 10YR or yellower, a value of 4 to 6, and a chroma of 1 to 3. The A horizon is silt loam or loam. In the upper 30 inches of the Bt horizon, hue is 10YR to 5Y, value is 5 or 6, and chroma is 2 or less; or value is 5 or less and chroma is less than 2. Mottles are in a hue of 5YR or yellower and a chroma of 4 to 8. The B2g horizon ranges from heavy silty clay loam or heavy clay loam to clay and is more than 30 percent silt. The C horizon generally is gray loam that commonly is stratified with sand, silt, or gravel.

Roanoke soils are similar to the Wehadkee and Worsham soils. They differ from the Wehadkee soils in having a clay subsoil and from the Worsham soils in having a higher content of silt in the Bt horizon. Roanoke soils are commonly near Altavista, Augusta, Chewacla, Congaree, and Wehadkee soils. They differ from all of those soils in having a clay subsoil. In addition, they are more poorly drained and grayer than all of those soils except the Wehadkee.

Roanoke silt loam (Ro).—This nearly level soil is on low terraces along major streams. It is flooded occasionally, and the water table remains near the surface for 60 days or more each year.

Included in mapping were some areas of soils that are not so gray as this Roanoke soil. In some places sandy material has been deposited over the original surface layer.

Most of this soil is wooded. Cleared areas commonly are used for pasture. Some fields have been planted to pines, and a few are idle. This soil is poorly suited to cultivated crops and is not commonly used for that purpose. Under good management, fescue can be grown for pasture. Capability unit Vw–1; woodland suitability group 2.

Starr Series

The Starr series consists of deep, well-drained, gently sloping soils on uplands. These soils formed in locally deposited alluvial and colluvial materials washed from the soils above them. They occur at the heads of drainageways, on foot slopes, and on small fans throughout the county. They are generally associated with soils that formed in material from mixed acidic and basic rocks.

In a representative profile, the surface layer is dark reddish-brown loam 8 inches thick. The subsoil extends to a depth of 43 inches. In the upper 5 inches the subsoil is dark reddish-brown heavy loam; the next 22 inches is dark reddish-brown silty clay loam; and the lower 8 inches is red silt loam. The substratum is a dark reddish-brown gravelly silt loam.

These soils have a slightly acid to strongly acid subsoil. They are medium in natural fertility. Permeability is moderately rapid, and the available water capacity is very high.

Representative profile of Starr loam, 2 to 6 percent slopes, located north of Cullen, at a point 3 miles north of junction of State Highway No. 661 and No. 47, on west side of the road:

Ap—0 to 8 inches, dark reddish-brown (5YR 3/4) loam; moderate, fine, granular structure; very friable; common fine roots; slightly acid; abrupt, smooth boundary.

B1—8 to 13 inches, dark reddish-brown (2.5YR 3/4) heavy loam; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; few fine mica flakes; few fine roots; slightly acid; clear, wavy boundary.

B2—13 to 35 inches, dark reddish-brown (2.5YR 3/4) silty clay loam; moderate, fine, subangular blocky structure; firm, sticky and slightly plastic; few fine mica flakes; slightly acid; clear, wavy boundary.

B3—35 to 43 inches, red (2.5YR 4/6) heavy silt loam; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; few fine mica flakes; few fine concretions; slightly acid; gradual, wavy boundary.

IIC—43 to 60 inches, dark reddish-brown (5YR 3/3) gravelly silt loam; structureless; friable; 30 to 40 percent fine to coarse gravel; many, medium, black concretions; few fine mica flakes; slightly acid.

The A horizon ranges from 2.5YR to 7.5YR in hue; value is 3 or 4, and chroma is 4 to 8. The texture ranges from silt loam to fine sandy loam, but loam is dominant. In the B horizon, hue ranges from 2.5YR to 7.5YR, value from 3 to 5, and chroma from 3 to 8. Texture ranges from heavy loam to silty clay loam, and the content of clay is 18 to 35 percent. The C horizon generally is a stratum of gravelly silt loam and commonly contains many concretions of black oxide. The solum ranges from 40 to 52 inches in thickness. Depth to bedrock is 10 to 20 feet. Few fine mica flakes are throughout the solum, and few fine concretions are common in the lower part of the solum. Reaction ranges from strongly acid to slightly acid in the subsoil.

Starr soils are similar to the Abell, State, and Wickham soils. They are less acid than the Abell soils and generally have a redder hue. They differ from State and Wickham soils in lacking a Bt horizon.

Starr soils are commonly near Cecil, Cullen, Georgeville, Madison, and Mecklenburg soils. They differ from all those soils in that they formed in recently deposited alluvial and colluvial materials and their subsoil contains less clay. In addition, Starr soils are less acid than the Cecil, Georgeville, and Madison soils.

Starr loam, 2 to 6 percent slopes (SrB).—This soil is in small areas at the heads of drainageways and on foot slopes or alluvial fans.

Included in mapping were areas where the surface layer is fine sandy loam, and a few areas where it is gravelly. In places the subsoil is underlain by gravelly material at a shallow depth. Also included were small areas of Abell soils.

Runoff is medium, and the hazard of erosion is moderate if the soil is properly managed.

Most of the acreage is used for cultivated crops, pasture, and gardens, but some is used for woodland. This soil is well suited to most field crops and to hay and pasture. It is fairly well suited to small grain, alfalfa, and bright tobacco. Capability unit IIe–3; woodland suitability group 1.

State Series

The State series consists of deep, well-drained, gently sloping soils on low terraces near major streams. These soils are only a few feet higher than the adjoining bottom land and are subject to occasional flooding.

In a representative profile, the surface layer is dark-brown silt loam 10 inches thick. The subsoil extends to a depth of 45 inches. In the upper 5 inches, the subsoil is brown silt loam; the next 20 inches is strong-brown heavy loam; and the lower 10 inches is brown loam. The substratum is yellowish-brown fine sandy loam that is mottled in the lower part.

State soils have a strongly acid to very strongly acid subsoil and are medium in natural fertility. Permeability is moderately rapid, and the available water capacity is medium.

Representative profile of State silt loam, 2 to 6 percent slopes, at a point 200 feet south of State Highway No. 607 and 1 mile east of the Roanoke River bridge:

Ap—0 to 10 inches, dark-brown (10YR 4/3) silt loam; weak fine, granular structure; very friable; common fine and medium roots; medium acid; abrupt, smooth boundary.

B1—10 to 15 inches, brown (7.5YR (4/4) silt loam; weak, fine, subangular blocky structure and moderate, medium, granular structure; friable; common fine and medium roots; common fine and medium pores; strongly acid; clear, smooth boundary.

B2t—15 to 35 inches, strong-brown (7.5YR 5/6) heavy loam; weak, fine, subangular blocky structure; slightly hard, friable, slightly plastic and slightly sticky; few fine and medium roots; common fine and medium pores; few fine mica flakes; thin discontinuous clay films; strongly acid; gradual, wavy boundary.

B3—35 to 45 inches, brown (7.5YR 4/4) loam; weak, fine, subangular blocky structure; friable, slightly sticky; few fine and medium roots; few fine and medium pores; few fine mica flakes; strongly acid; clear, wavy boundary.

IIC1—45 to 50 inches, yellowish-brown (10YR 5/8) fine sandy loam; weak, medium granular structure to massive; very friable to loose, slightly sticky; few to common fine mica flakes; very strongly acid; gradual, wavy boundary.

IIC2—50 to 60 inches, mottled yellowish-brown (10YR 5/8), pale-brown (10YR 6/3), and brown (7.5YR 4/4) loamy soil material; single grain; loose; common fine mica flakes; very strongly acid.

The Ap horizon has a hue of 7.5YR or 10YR, a moist value of 4 to 5, and a chroma of 2 to 4. Texture is dominantly silt loam but is fine sandy loam or loam in some places. In the B2t horizon hue is 7.5YR or 10YR; value is 3 to 5, and chroma is 3 to 6. This horizon is dominantly light clay loam but includes heavy loam, sandy clay loam, or silty clay loam. The C horizon ranges from loam to fine sandy loam, and in some places it is stratified loamy and sandy soil material that contains a few pebbles and cobblestones.

The solum ranges from about 40 to 60 inches in thickness, but commonly it is less than 50 inches thick. Depth to rock ranges from about 6 feet to more than 10 feet. Depth to unconforming stratified loamy soil material, sand, and gravel is more than 40 inches. Clay content of the upper 20 inches of the Bt horizon ranges from about 18 to 35 percent but commonly is in the lower end of the range. Reaction is very strongly acid to strongly acid where the soils are unlimed.

State soils are similar to Abell, Congaree, Masada, Starr, and Wickham soils. They differ from Congaree and Starr soils in having a Bt horizon. State soils have less clay in the subsoil

than the Masada soils and are less red than the Wickham soils. They differ from Abell soils in having a thinner Bt horizon that does not extend into unconforming material.

State soils are commonly near Altavista, Augusta, Buncombe, Chewacla, Congaree, Toccoa, and Wickham soils. They are better drained than the Altavista, Augusta, and Chewacla soils, and unlike those soils, they do not have gray mottles. They have a higher content of clay in the profile than the Buncombe and Toccoa soils.

State silt loam, 2 to 6 percent slopes (StB).—This soil is on low terraces along the major streams, where it is subject to occasional overflow.

Included with this soil in mapping were small areas of soils that have a sandy loam or fine sandy loam surface layer. Also included were small areas of Chewacla soils.

Runoff is medium, and the hazard of erosion is moderate.

Most of the acreage is used for cultivated crops or pasture. There are a few wooded areas, and some fields have been planted to pines. This soil is well suited to most crops and pasture plants. It is fairly well suited to bright tobacco. Occasional overflow is the major concern. Capability unit IIe–3; woodland suitability group 1.

Toccoa Series

The Toccoa series consists of deep, well-drained, nearly level soils on flood plains of major streams throughout the county. These soils formed in loamy alluvial sediment that washed mostly from residual soils of the Piedmont Plateau.

In a representative profile, the surface layer is dark-brown fine sandy loam 8 inches thick. The underlying material, to a depth of more than 50 inches, is brown fine sandy loam in which the sand content increases slightly with depth.

Toccoa soils have a slightly acid to medium acid subsoil. They are medium in natural fertility. Permeability is moderately rapid, and the available water capacity is medium to low.

Representative profile of Toccoa fine sandy loam, in a pasture on Staunton Hill plantation, 100 feet north of the Roanoke (Staunton) River:

Ap—0 to 8 inches, dark-brown (10YR 3/3) fine sandy loam; weak, fine, granular structure; very friable; many fine roots; few fine mica flakes; medium acid; abrupt, smooth boundary.

C1—8 to 36 inches, brown (10YR 4/3) fine sandy loam; massive; slightly hard when dry, very friable; few fine roots; few fine mica flakes; medium acid; gradual, smooth boundary.

C2—36 to 52 inches, brown (10YR 5/3) fine sandy loam; massive; slightly hard when dry, very friable; common fine mica flakes; medium acid.

The A horizon has a hue of 5YR to 10YR, a value of 3 to 8, and chroma of 2 to 4. This horizon is dominantly fine sandy loam, but it is loamy fine sand in some places. The C horizon has a hue of 5YR to 10YR; its value and chroma are 3 to 6. Texture of the C1 and C2 horizons is fine sandy loam to sandy loam. In some places a buried B horizon is at a depth of more than 20 inches. Reaction is slightly acid to medium acid. Stratification of sandy and silty banding is present throughout the profile in some places.

Toccoa soils are similar to the Buncombe and Congaree soils. They have a higher content of clay than Buncombe soils but a lower content of clay than Congaree soils. In addition, their permeability is moderately rapid, whereas that of Congaree soils is moderate.

Toccoa soils commonly are near Buncombe and Congaree soils. They also are closely associated with Chewacla and Wehadkee soils. Toccoa soils are better drained and are less gray than Chewacla and Wehadkee soils.

Toccoa fine sandy loam (To).—This nearly level soil is on flood plains near major streams and is occasionally flooded for brief periods of time.

Included in mapping were small areas of Buncombe and Congaree soils.

Most of the acreage is used for cultivated crops or pasture. Some areas are wooded, however, and some fields have been planted to pines. This soil is well suited to corn, soybeans, and fescue. It is fairly well suited to small grain, legumes, and dark tobacco. Capability unit IIw–1; woodland suitability group 11.

Turbeville Series

The Turbeville series consists of deep, well-drained, undulating to hilly soils on terraces along major streams. These soils formed in old alluvial deposits.

In a representative profile, the surface layer is fine sandy loam about 11 inches thick. It is dark gray in the upper 2 inches and yellowish brown in the main part. The subsoil extends to a depth of 84 inches. In the upper 9 inches the subsoil is red and yellowish-red sandy clay loam and fine sandy loam; the next 52 inches is red to dark-red clay; and the lower 12 inches is dark-red heavy clay loam that contains fine quartz fragments.

These soils have a strongly acid to very strongly acid subsoil. They are low in natural fertility. Permeability is moderate, and the available water capacity is medium.

Representative profile of Turbeville fine sandy loam, 2 to 6 percent slopes, eroded, in woodland, on Roanoke Plantation near Randolph, 100 yards west of the main house and 100 feet south of the lane:

O2—½ inch to 0, black, partially decomposed organic materials.

A1—0 to 2 inches, dark-gray (10YR 4/1) fine sandy loam; weak, fine, granular structure; very friable; abundant fine roots; 5 to 10 percent fine gravel; medium acid; abrupt, smooth boundary.

A2—2 to 11 inches, yellowish-brown (10YR 5/4) fine sandy loam; weak, fine, granular structure; very friable; common fine roots; 5 to 10 percent fine gravel; medium acid; clear, wavy boundary.

B1—11 to 15 inches, yellowish-red (5YR 4/6) fine sandy loam; many, medium, distinct, yellowish-brown (10YR 5/4) mottles; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; 5 to 10 percent fine gravel; strongly acid; clear, wavy boundary.

B21t—15 to 20 inches, red (2.5YR 4/6) sandy clay loam; many, fine, faint, yellowish-red (5YR 4/6) mottles; moderate, fine, subangular blocky structure; friable, sticky and slightly plastic; few medium roots; common fine and medium pores; thin patchy clay films; strongly acid; clear, wavy boundary.

B22t—20 to 31 inches, red (10YR 4/6) to dark-red (10R 3/6) clay; moderate, fine, subangular blocky structure; firm, very sticky and plastic; common fine pores; thin continuous clay films; strongly acid; clear, wavy boundary.

B23t—31 to 72 inches, dark-red (10R 3/6) clay; moderate, fine, subangular blocky structure; firm, very sticky and plastic; common fine pores; thin continuous clay films; very strongly acid; gradual, smooth boundary.

B3t—72 to 84 inches, dark-red (10R 3/6) heavy clay loam; weak, fine subangular blocky structure; firm, sticky and plastic; thin discontinuous clay films; 15 to 20 percent very fine quartz particles; few fine mica flakes; very strongly acid.

The Ap horizon is brown, yellowish brown, or dark brown. Texture of the A horizon is dominantly fine sandy loam but includes sandy loam and gravelly sandy loam. In severely eroded areas, the A horizon is mostly yellowish-red or red clay loam. The B2t horizon is dominantly 2.5YR or 10R in hue; value is 4 in the upper part of the horizon and 3 in the lower part, and chroma ranges from 4 to 8. Texture of the B2t horizon is chiefly clay, but it ranges to heavy clay loam. The B horizon is very strongly acid to strongly acid. Thickness of the solum and depth to bedrock each is more than 60 inches. Content of coarse fragments ranges from about 5 to 20 percent. The fragments consist of rounded quartz, gneiss, or schist gravel or cobblestones. In the lower part of the solum, there are stone lines in some places.

Turbeville soils are similar to the Cecil, Cullen, and Masada soils. They are deeper than all of those soils. In addition, they have a darker red B2t horizon than all the soils except the Cullen.

Turbeville soils are commonly near Cecil soils on uplands and Masada soils on terraces. Turbeville soils differ from those soils in being very deep. They differ from the Masada soils in having a dark-red horizon in the subsoil.

Turbeville fine sandy loam, 2 to 6 percent slopes, eroded (TuB2).—This undulating to gently sloping soil is on high terraces. It has the profile described as representative for the series. The surface layer ranges from 6 to 12 inches in thickness.

Included with this soil in mapping were small areas of severely eroded soils that have a yellowish-red clay loam surface layer and small areas where the surface layer is gravelly.

Runoff is medium, and the hazard of further erosion is moderate. Most of the acreage is wooded. Cleared areas are used mostly for cultivated crops and pasture. This soil is well suited to most crops grown locally. It is fairly well suited to bright tobacco. Capability unit IIe-4; woodland suitability group 4.

Turbeville fine sandy loam, 6 to 15 percent slopes, eroded (TuD2).—This rolling soil is on terraces that adjoin major streams. Its profile is similar to the one described as representative for the series, but the surface layer ranges from 5 to 10 inches in thickness.

Included with this soil in mapping were small areas of severely eroded soils that have a surface layer of yellowish-red clay loam and small areas where the surface layer is gravelly.

Runoff is medium to rapid, and the hazard of further erosion is severe.

Most of this soil is wooded. Cleared areas are used mostly for pasture and hay. This soil is fairly well suited to most crops and is well suited to fescue grown for pasture. Capability unit IIIe–4; woodland suitability group 4.

Turbeville fine sandy loam, 15 to 35 percent slopes, eroded (TuF2).—This hilly soil is on terraces that adjoin major streams. Its profile is a few inches thinner, but in other respects it is similar to the profile described as representative for the series. The surface layer ranges from 4 to 8 inches in thickness.

Included with this soil in mapping were small areas of severely eroded soils that have a yellowish-red clay loam surface layer and small areas where the surface layer is gravelly.

Runoff is rapid to very rapid, and the hazard of further erosion is very severe.

Most of this soil is wooded. Cleared areas are used mostly for pasture and hay. This soil is not suited to cultivated crops. It is better suited to trees or pasture. Capability unit IVe–1; woodland suitability group 4.

Turbeville clay loam, 2 to 6 percent slopes, severely eroded (TvB3).—This undulating to gently sloping soil is on high terraces. Most of the original surface layer and, in places, part of the subsoil have been removed by erosion. The present surface layer is yellowish-red clay loam, but in other respects the profile is similar to the one described as representative for the series.

Included with this soil in mapping were small areas of less eroded soils that have a fine sandy loam surface layer. Also included were small areas of Gullied land.

Runoff is medium, and the hazard of further erosion is severe. Most of this soil is used for pasture or cultivated crops. The soil is well suited to small grain, red clover, and most kinds of pasture plants. It is fairly well suited to cultivated crops, alfalfa, and fescue. Capability unit IIIe–5; woodland suitability group 5.

Turbeville clay loam, 6 to 15 percent slopes, severely eroded (TvD3).—This rolling soil is on high terraces that adjoin major streams. Most of the original surface layer and, in places, part of the subsoil have been removed by erosion, and the present surface layer is yellowish-red to red clay loam. In other respects, however, the soil has a profile similar to the one described as representative for the series.

Included with this soil in mapping were small areas of less eroded soils that have a fine sandy loam surface layer. Also included were small areas of Gullied land.

Runoff is medium to rapid, and the hazard of further erosion is very severe. This soil is used mostly for pasture and hay. It is poorly suited to cultivated crops and only fairly well suited to pasture. Capability unit IVe–1; woodland suitability group 5.

Vance Series

The Vance series consists of deep, well-drained soils that have a clayey subsoil. These undulating to rolling soils are on uplands. They formed in materials weathered from acid rocks, such as andesitic flow, tuff, and crystalline granite.

In a representative profile, the surface layer is grayish-brown fine sandy loam about 7 inches thick. The subsoil, which extends to a depth of 33 inches, is brownish-yellow sandy clay in the upper part and prominently mottled, yellowish-brown clay in the lower part. The substratum is brown, white, and red, streaked clayey material that is mixed with strongly weathered rock fragments. Bedrock is at a depth of 52 inches.

These soils have a strongly acid to very strongly acid subsoil. They are low in natural fertility. Permeability is slow, and available water capacity is medium.

Representative profile of Vance fine sandy loam, 2 to 6 percent slopes, eroded, in a tobacco field, 1 mile west of Laconia on State Highway No. 640, on south side of the road:

Ap—0 to 7 inches, grayish-brown (10YR 5/2) fine sandy loam; weak, fine, granular structure; very friable; few fine and medium roots; 5 to 10 percent fine gravel; strongly acid; clear, smooth boundary.

B21t—7 to 17 inches, brownish-yellow (10YR 6/6) sandy clay; many, fine, distinct, very pale-brown (10YR 7/4) mottles; moderate, fine, angular blocky structure; firm, sticky and plastic; few medium roots; common fine

pores; few thin clay films; very strongly acid; clear, wavy boundary.

B22t—17 to 29 inches, yellowish-brown (10YR 5/6) clay; few, fine, prominent, yellowish-red (5YR 5/8) mottles; moderate, medium, angular blocky structure; very firm, sticky and plastic; few fine pores; few thin clay films; very strongly acid; clear, wavy boundary.

B3t—29 to 33 inches, yellowish-brown (10YR 5/6) clay; few, medium, prominent, red (10R 4/6) mottles and thin streaks of light gray (2.5Y 7/2); weak, medium, angular blocky structure; firm, sticky and plastic; few thin clay films; very strongly acid; clear, wavy boundary.

C—33 to 52 inches, brown, white, and red streaked, firm, clayey saprolite that shows original rock structure; very strongly acid.

R—52 inches, andesitic flow and tuff.

The A horizon is grayish brown, brown, or yellowish brown in a hue of 10YR; value is 3 or more, and chroma is 2 or more. Texture of the A horizon normally is fine gravelly sandy loam or fine sandy loam. In some places where the soil is eroded, the Ap horizon is clay loam. The Bt horizon ranges from 16 to 36 inches in total thickness. It ranges from 10YR to 5YR in hue, from 4 to 6 in value, and from 4 to 8 in chroma. Red and brown mottles are common. In some places the lower part of the Bt horizon contains some gray or white streaks and mottles. Reaction of the B horizon is strongly acid or very strongly acid. The solum ranges from 20 to 45 inches in thickness. Depth to hard rock is more than 4 feet.

Vance soils are similar to Appling, Enon, Helena, Mayodan, and Wedowee soils. They are less permeable than Appling, Mayodan, and Wedowee soils. They differ from Helena soils in lacking gray mottles in the upper B2t horizon. Vance soils are more acid than Enon soils.

Vance fine gravelly sandy loam, 2 to 6 percent slopes, eroded (VaB2).—This undulating to gently sloping soil is on uplands. It has a fine gravelly sandy loam surface layer, but in other respects its profile is similar to the one described as representative for the series. The surface layer ranges from 5 to 9 inches in thickness.

Included with this soil in mapping were small areas of Worsham soils and small areas of severely eroded soils that have a surface layer of clay loam.

Runoff is medium, and the hazard of further erosion is moderate. Most of the acreage is wooded. Cleared areas are used mostly for cultivated crops and pasture. This soil is fairly well suited to cultivated crops. It is well suited to small grain and pasture. Capability unit IIe–1; woodland suitability group 7.

Vance fine gravelly sandy loam, 6 to 15 percent slopes, eroded (VaD2).—This rolling to strongly sloping soil is on uplands. It has a profile similar to the one described as representative for the series, but the surface layer is fine gravelly sandy loam that ranges from 5 to 9 inches in thickness. Slopes are mostly medium in length and are plane.

Included with this soil in mapping were small areas of severely eroded soils that have a clay loam surface layer. Also included were small areas of Abell soils.

Runoff is medium to rapid, and the hazard of further erosion is severe. Most of the acreage is wooded. Cleared areas are used mostly for pasture and hay. This soil is poorly suited to cultivated crops. It is fairly well suited to fescue grown for pasture. Capability unit IIIe–1; woodland suitability group 7.

Vance fine sandy loam, 2 to 6 percent slopes, eroded (VcB2).—This undulating to gently sloping soil is on uplands. It has the profile described as representative for the series. The surface layer ranges from 5 to 9 inches in thickness.

Included with this soil in mapping were small areas of Worsham soils and small areas of severely eroded soils that have a clay loam surface layer.

Runoff is medium, and the hazard of further erosion is moderate. Most of this soil is wooded. Cleared areas are used mostly for cultivated crops and pasture. This soil is fairly well suited to most cultivated crops. It is well suited to pasture and to most kinds of hay crops. Capability unit IIe–1; woodland suitability group 7.

Vance fine sandy loam, 6 to 10 percent slopes, eroded (VcC2).—This sloping soil is on uplands. Its profile is similar to that described as representative for the series, but its surface layer ranges from 5 to 9 inches in thickness. Slopes are mostly medium in length and are plane.

Included with this soil in mapping were small areas of Abell soils and small areas of severely eroded soils that have clay loam surface layer.

Runoff is medium to rapid, and the hazard of further erosion is severe. Most of this soil is wooded. Cleared areas are used mostly for pasture and hay. This soil is poorly suited to cultivated crops. It is fairly well suited to small grain and to most kinds of hay crops. It is better suited to fescue grown for pasture. Capability unit IIIe–1; woodland suitability group 7.

Vance fine sandy loam, 10 to 15 percent slopes, eroded (VcD2).—This rolling to strongly sloping soil is on uplands. Its profile is a few inches thinner, but in other respects it is similar to the one described as representative for the series. Slopes are mostly medium in length and slightly concave. The surface layer ranges from 5 to 9 inches in thickness.

Included with this soil in mapping were small areas of Abell soils and small areas of severely eroded soils that have a clay loam surface layer.

Runoff is rapid, and the hazard of further erosion is very severe where this soil is cultivated.

Most of this soil is wooded. Cleared areas are used mostly for pasture and hay. This soil is not well suited to cultivated crops, and it is poorly suited to small grain and hay. It is better suited to trees or to fescue grown for pasture. Capability unit IVe–1; woodland suitability group 7.

Wedowee Series

The Wedowee series consists of deep, well-drained soils that have a clayey layer in the subsoil. These undulating to rolling soils are on uplands. They formed in materials weathered from granite and granite gneiss.

In a representative profile, the surface layer is light yellowish-brown fine sandy loam 7 inches thick. The subsoil extends to a depth of 28 inches. The upper 4 inches of the subsoil is light yellowish-brown clay loam; the next 13 inches is yellowish-red clay; and the lower 4 inches is yellowish-red clay loam mottled with brownish yellow. The substratum is yellowish-red and yellowish-brown mottled clay loam mixed with strongly weathered rock fragments. Hard bedrock occurs at a depth of 48 inches.

These soils have a strongly acid to very strongly acid subsoil and are low in natural fertility. Permeability is moderate, and available water capacity is medium.

Representative profile of Wedowee fine sandy loam, 2 to 6 percent slopes, eroded, under woodland of oak and pine in an area that formerly was a field, near Red House

on State Highway No. 701, one-half mile west of State Highway No. 736, on north side of the road:

Ap—0 to 7 inches, light yellowish-brown (10YR 6/4) fine sandy loam; weak, fine, granular structure; very friable; 5 to 10 percent fine gravel; many fine roots; strongly acid; abrupt, smooth boundary.

B1t—7 to 11 inches, light yellowish-brown (10YR 6/4) clay loam; many, fine, distinct, strong-brown (7.5YR 5/6) mottles; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; 5 to 10 percent fine gravel; few medium roots; strongly acid; clear, wavy boundary.

B2t—11 to 24 inches, yellowish-red (5YR 5/6) clay; moderate, fine, subangular blocky structure; firm, sticky and plastic, thin discontinuous clay films; 5 to 10 percent fine gravel; few fine mica flakes; strongly acid; clear, wavy boundary.

B3t—24 to 28 inches, yellowish-red (5YR 5/6) clay loam; many, medium, distinct, brownish-yellow (10YR 6/6) mottles; moderate, medium, subangular blocky structure; friable, sticky and plastic; thin discontinuous clay films; 5 to 10 percent fine gravel; few fine mica flakes; strongly acid; clear, irregular boundary.

C—28 to 48 inches, yellowish-red and yellowish-brown, mottled clay loam saprolite; common fine mica flakes; shows original rock structure; strongly acid; weathered from granitic bedrock.

R—48 inches, hard, acidic granite gneiss bedrock.

The A horizon ranges from 2.5Y to 10YR in hue; value is 5 to 7, and chroma is 2 to 8. Texture is dominantly fine sandy loam but includes sandy loam or, where the soil is severely eroded, clay loam. In the Bt horizon, hue ranges from 5YR to 10YR, value is 4 to 5, and chroma is 4 to 8. Texture ranges from heavy clay loam to clay, and the clay content ranges from 35 to 45 percent. The C horizon is dominantly yellowish-red and yellowish-brown, variegated saprolite. The solum ranges from 20 to about 40 inches in thickness. Depth to bedrock ranges from 4 feet to more than 8 feet. A few pebbles and a few fine mica flakes are commonly throughout the solum. Reaction is strongly acid or very strongly acid in the subsoil.

Wedowee soils are similar to and commonly are near Appling, Cecil, Madison, and Pacolet soils. They are not so deep as Appling and Cecil soils. They are not so red in the B2t horizon as Cecil and Pacolet soils, and they contain less mica flakes than the Madison soils.

Wedowee fine sandy loam, 2 to 6 percent slopes, eroded (WdB2).—This undulating to gently sloping soil is on uplands. It has the profile described as representative for the series. Slopes are medium in length and are slightly convex. The surface layer ranges from 5 to 9 inches in thickness.

Included with this soil in mapping were small areas of Abell soils and small areas of severely eroded soils that have a clay loam surface layer.

Runoff is medium, and the hazard of further erosion is moderate.

Most of this soil is wooded. Cleared areas are used mostly for cultivated crops, hay, and pasture. This soil is well suited to small grain and pasture. It is fairly well suited to cultivated crops and alfalfa. Capability unit IIe–1; woodland suitability group 4.

Wedowee fine sandy loam, 6 to 15 percent slopes, eroded (WdD2).—This rolling to strongly sloping soil is on uplands. It is a few inches thinner, but in other respects the profile is similar to the one described as representative for the series. Slopes are mostly medium in length and are slightly convex. The surface layer ranges from 5 to 9 inches in thickness.

Included with this soil in mapping were small areas of Louisburg soils and small areas of severely eroded soils that have a clay loam surface layer.

Runoff is medium to rapid, and the hazard of further erosion is severe.

Most of this soil is wooded. Cleared areas are used mostly for pasture and hay. This soil is not well suited to cultivated crops. It is fairly well suited to poorly suited to small grain and hay. It is better suited to fescue pasture or to trees. Capability unit IIIe–1; woodland suitability group 4.

Wehadkee Series

The Wehadkee series consists of deep, poorly drained, nearly level soils on flood plains. These soils formed in recent alluvial sediment that washed from soils of the Piedmont Plateau.

In a representative profile, the surface layer is dark grayish-brown silt loam about 7 inches thick. The subsoil, which extends to a depth of 54 inches, is dark grayish-brown silt loam mottled with yellowish brown and yellowish red in the upper part. It is mottled, dark-gray silt loam and silty clay loam in the lower part. The substratum is mottled, gray silty clay loam.

These soils have a strongly acid to very strongly acid subsoil. They are medium in natural fertility. They are moderately permeable and have medium to high available water capacity.

Representative profile of Wehadkee silt loam, in a pasture in the southwestern part of the county, southeast of Aspenwall at the southern end of State Highway No. 678, on Roanoke River bottom land:

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable; many fine and medium roots; strongly acid; abrupt, smooth boundary.

B1—7 to 16 inches, dark grayish-brown (10YR 4/2) silt loam; many, medium, prominent, yellowish-brown (10YR 5/6) and yellowish-red (5YR 4/6) mottles; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots; many fine pores; few fine mica flakes; strongly acid; clear, wavy boundary.

B21g—16 to 29 inches, dark-gray (10YR 4/1) silt loam; many, medium, prominent, strong-brown (7.5YR 5/6) mottles; weak, fine, subangular blocky structure; friable, slightly sticky and slightly plastic; few medium roots; few fine pores; few fine mica flakes; strongly acid, clear, wavy boundary.

B22g—29 to 54 inches, dark-gray (10YR 4/1) light silty clay loam; common, medium, distinct, dark yellowish-brown (10YR 4/4) mottles; weak, medium, subangular blocky structure; friable, slightly sticky and slightly plastic; few fine pores; few fine mica flakes; strongly acid; gradual, smooth boundary.

Cg—54 to 60 inches, gray (5Y 5/1) silty clay loam; few, medium, prominent, dark yellowish-brown (10YR 4/4) mottles; massive; firm, sticky and plastic; many medium concretions; few fine mica flakes; strongly acid.

The A horizon is dominantly dark grayish brown or brown, and in some places it is mottled grayish brown. Its hue is 10YR, value is 3 to 6, and chroma is 1 to 3. The A horizon is dominantly silt loam, but it ranges from fine sandy loam to silty clay loam. In the B horizon the matrix color is dominantly dark gray, but it ranges from light gray through dark gray in a hue of 7.5YR to 2.5Y. Texture of the B horizon ranges from heavy sandy loam to light silty clay loam. In some places the C horizon is stratified sand, silt, clay, and gravel and contains few to many concretions. The solum ranges from about 36 to 60 inches in thickness. Depth to hard rock is commonly more than 5 feet and ranges to 20 feet or more. Mica flakes ranges from few to common. Reaction is strongly acid to very strongly acid. The Wehadkee soils in Charlotte County are more acid than the Wehadkee soils in other survey areas.

Wehadkee soils are similar to the Chewacla, Roanoke, and Worsham soils. They are grayer throughout the solum than the Chewacla soils. They have less clay in the subsoil than Roanoke and Worsham soils.

Wehadkee soils are commonly near the Buncombe, Chewacla, Congaree, Roanoke, and Toccoa soils. They are more poorly drained and grayer than all those soils except Roanoke soils. In addition, they contain less sand than the Buncombe and Toccoa soils.

Wehadkee fine sandy loam, overwash (We).—This nearly level soil is on stream bottoms that are frequently flooded. The present surface layer is yellowish-brown fine sandy loam, 12 to 20 inches thick, that has been recently deposited over the original silt loam surface layer. The present surface layer contrasts strongly in color with the original one. Below the overwash, the profile is similar to that described as representative for the series.

Included with this soil in mapping were some small areas of silt loam and loam overwash material.

Most of the acreage is wooded. Cleared areas are used mostly for pasture. This soil is fairly well suited to corn and soybeans (fig. 5). It also is fairly well suited to pasture and hay plants but is poorly suited or very poorly suited to small grain, legumes, and tobacco. Capability unit IVw–1; woodland suitability group 2.

Wehadkee silt loam (Wh).—This nearly level soil is on flood plains throughout the county. It has the profile described as representative for the series.

Included with this soil in mapping were small areas of soils that have a loam or fine sandy loam surface layer and a few places where the subsoil is heavy silty clay loam. Some small areas of Chewacla or Roanoke soils also were included.

This soil is frequently flooded, and overflow water is slow to recede. Depressional areas are wet most of the year. This soil is poorly suited to most crops but is fairly well suited to fescue grown for pasture. Most of the acreage is wooded. Cleared areas are used mostly for pasture. Capability unit IVw–1; woodland suitability group 2.

Wehadkee-Chewacla complex (Wk).—This mapping unit consists of two nearly level soils on flood plains. These soils are in areas so intricately mixed or so small in size that it is not feasible to map them separately. The two soils occupy about equal acreages in the complex.

Figure 5.—**Area of Wehadkee fine sandy loam, overwash, that has been cleared and is used for corn and soybeans.**

Except that its surface layer varies in texture, the Wehadkee soil has a profile similar to the one described as representative for the series. This soil generally is farther from the stream channel or is several inches lower in elevation than the Chewacla soil, or both.

The Chewacla soil, too, has a surface layer of variable texture, but in other respects its profile is similar to that described as representative for the Chewacla series.

These soils are frequently flooded, and the floodwater is slow to recede. Some of the lowest areas may be wet most of the year. Some areas are subject to scouring and silting during major floods.

Most of the acreage is wooded. Cleared areas commonly are used for pasture. Soils of the complex are not suited to most crops, because of frequent flooding. They are suited to fescue grown for pasture or to trees. Capability unit IVw–1; woodland suitability group 2.

Wickham Series

The Wickham series consists of deep, well-drained, gently sloping to sloping soils on stream terraces and small colluvial fans. These soils formed in sediment derived from weathered igneous and metamorphic rocks of the Piedmont Plateau.

In a representative profile, the surface layer is dark yellowish-brown fine sandy loam about 8 inches thick. The subsoil, which extends to a depth of 50 inches, is yellowish-red mainly sandy clay loam in the upper part and strong-brown sandy loam in the lower part. The substratum is yellowish-brown gravelly sandy loam.

These soils have a slightly acid to strongly acid subsoil. They are medium in natural fertility. Permeability is moderate, and the available water capacity is medium.

Representative profile of Wickham fine sandy loam, 2 to 6 percent slopes, on the Roanoke Plantation, 1 mile northwest of Randolph, on north side of State Highway No. 607:

Ap—0 to 8 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; weak, fine, granular structure; very friable; few medium roots; 5 to 10 percent fine gravel; slightly acid; abrupt, smooth boundary.

B1—8 to 13 inches, yellowish-red (5YR 5/6) heavy fine sandy loam; common, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, fine, subangular blocky structure; friable; few medium roots; common fine pores; 5 to 10 percent fine gravel; slightly acid; clear, smooth boundary.

B2t—13 to 42 inches, yellowish-red (5YR 5/8) sandy clay loam; moderate, fine, subangular blocky structure; hard, firm, sticky and slightly plastic; few medium roots; common fine pores; thin discontinuous clay films; 5 to 10 percent fine gravel; few fine mica flakes; slightly acid; clear, smooth boundary.

B3—42 to 50 inches, strong-brown (7.5YR 5/6) sandy loam; weak, fine, subangular blocky structure; friable; 10 to 15 percent fine gravel; common fine mica flakes; slightly acid; clear, smooth boundary.

IIC—50 to 62 inches, yellowish-brown (10YR 5/6) gravelly sandy loam; single grain; friable, common fine mica flakes; slightly acid.

The A horizon has a hue of 5YR to 10YR, a value of 4 to 6, and a chroma of 2 to 6. Texture is dominantly fine sandy loam, but in places it is loam or silt loam. The Bt horizon has a hue of 2.5YR or 5YR, value is 4 to 6, and chroma is 3 or higher; texture is dominantly sandy clay loam but in places includes light clay loam and light silty clay loam. The C horizon is

commonly stratified sand, silt, clay, and gravel. The solum ranges from 40 to more than 60 inches in thickness. Reaction ranges from strongly acid to slightly acid in the subsoil. Depth to hard rock is more than 6 feet.

Wickham soils are similar to the Altavista, Masada, and State soils. They are better drained than Altavista soils and have less clay in the B2t horizon than the Masada soils. Wickham soils differ from State soils in having more clay in the subsoil and in having a redder Bt horizon.

Wickham soils are commonly near the Altavista, Masada, and State soils. They also are closely associated with the Augusta soils. They are better drained than the Augusta soils, which are poorly drained, and their subsoil lacks the gray mottles that are in the subsoil of the Augusta soils.

Wickham fine sandy loam, 2 to 6 percent slopes (WlB).—This soil is on low stream terraces and in upland depressions where colluvium has been deposited. It commonly occurs on the toe of footslopes or below escarpments of the higher terraces. This soil has the profile described as representative for the series.

Included with this soil in mapping were small areas of soils having a silt loam or loam surface layer and some small areas where part of the surface layer has been removed by erosion.

Runoff is medium, and the hazard of erosion is moderate.

Most of the acreage has been cleared and is under cultivation or is used for pasture. A few small areas remain in woodland, and some fields have been planted to pines. This Wickham soil is well suited to most locally grown crops. Capability unit IIe–3; woodland suitability group 1.

Wickham fine sandy loam, 6 to 10 percent slopes, eroded (WlC2).—This soil is on colluvial fans and at the base of steeper soils on uplands and higher terraces. Part of the original surface layer has been removed by erosion, and the subsoil is exposed in places. Otherwise, the profile of this soil is similar to the one described as representative for the series.

Included with this soil in mapping were small areas of soils that have a silt loam or loam surface layer. Also included were a few areas where the subsoil is clay.

Runoff is medium, and the hazard of further erosion is severe.

Most of the acreage has been cleared and is used for pasture and cultivated crops. A few small areas remain in trees, and some fields have been planted to pines. This soil is well suited to most crops. It is fairly well suited to alfalfa and bright tobacco. Capability unit IIIe–1; woodland suitability group 4.

Wilkes Series

The Wilkes series consists of well-drained, sloping to steep soils on uplands. These soils formed in the weathered products of mixed basic and acidic igneous and metamorphic rocks. They are adjacent to major streams and on narrow ridges throughout the county.

In a representative profile, the surface layer is brown fine sandy loam 7 inches thick and is 15 to 20 percent rock fragments. The subsoil, which extends to a depth of 15 inches, is yellowish-brown clay loam and clay mottled with yellow, green, and olive. The subsoil contains some rock fragments. The material underlying the subsoil is a mixture of clay loam and weathered rock fragments. Bedrock is at a depth of about 24 inches.

Wilkes soils are neutral to medium acid and are low to medium in natural fertility. Permeability is moderately slow, and available water capacity is low.

Representative profile of Wilkes fine sandy loam, 2 to 6 percent slopes, in a field planted to pines, near the town limits of Charlotte Court House on State Highway No. 47, on west side of the road:

Ap—0 to 7 inches, brown (10YR 4/3) fine sandy loam; weak, fine, granular structure; very friable; 15 to 20 percent fine gravel; few, fine roots; slightly acid; abrupt, smooth boundary.

B1t—7 to 10 inches, yellowish-brown (10YR 5/4) clay loam; weak, fine, subangular blocky structure; friable, sticky and slightly plastic; few fine and medium roots; 15 to 20 percent fine gravel; slightly acid; clear, smooth boundary.

B2t—10 to 15 inches, yellowish-brown (10YR 5/4) clay; many, fine, distinct, yellow, green, and olive mottles caused by partially weathered minerals; weak, coarse, angular blocky structure; very firm, very sticky and very plastic; thin discontinuous clay films on surface of peds; 5 to 10 percent fine gravel; slightly acid; clear, irregular boundary.

C—15 to 24 inches, yellowish-brown (10YR 5/6) clay loam saprolite streaked with black and olive; massive; shows original rock structure; firm; neutral.

R—24 inches, black, green, and white hornblende schist bedrock.

The A horizon has a hue of 7.5YR and yellower, a value of 4 to 6, and a chroma of 2 to 5. Texture ranges from sandy loam to loam. The surface layer commonly is 10 to 35 percent fine gravel. The Bt horizon has a hue of 5YR to 10YR, a value of 4 or 5, and a chroma of 4 to 8. It ranges from clay loam to clay in texture and from 3 to 7 inches in thickness. The C horizon is quite variable in color and texture. The solum is less than 20 inches thick. Depth to hard rock is 20 to 48 inches. Reaction in the subsoil is medium acid to neutral.

Wilkes soils are similar to the Goldston, Iredell, Louisa, and Louisburg soils. They contain more clay in the subsoil than the Goldston, Louisa, and Louisburg soils. They are not so deep to bedrock as the Iredell soils.

Wilkes soils are commonly near Appling, Cecil, Enon, Helena, Iredell, and Mecklenburg soils. They are more shallow than all of those soils. In addition, they have a thinner subsoil than those soils and are not so acid as the Appling, Cecil, and Helena soils.

Wilkes fine sandy loam, 2 to 6 percent slopes (WmB).—This soil has the profile described as representative for the series. It is mainly on narrow ridges throughout the county.

Included with this soil in mapping were a few places where bedrock crops out and some small areas where the surface layer is gravelly. Small spots of Iredell soils were included in some mapped areas.

Runoff is medium, and the hazard of erosion is severe where this soil is cultivated.

Most of the acreage is wooded; cleared areas are used mostly for pasture. Some fields have been planted to pines. This soil is poorly suited to cultivated crops and is only fairly well suited to small grain and red clover. It is better suited to hay and to fescue grown for pasture. Capability unit IIIe–1; woodland suitability group 8.

Wilkes fine sandy loam, 6 to 15 percent slopes (WmD).—This rolling and strongly sloping soil is on uplands. Its profile is similar to the one described as representative for the series, but the surface layer ranges from 5 to 9 inches in thickness. Slopes are mostly medium in length and slightly convex.

Included with this soil in mapping were small areas that have bedrock outcrops. Also included were small areas where the surface layer is gravelly.

Runoff is medium to rapid, and the hazard of erosion is very severe.

Nearly all of the acreage is wooded. Cleared areas are used mostly for pasture. This soil is poorly suited to cultivated crops and is poorly suited to small grain and alfalfa. It is fairly well suited to most hay plants, but a better use is for fescue pasture or forest. Capability unit IVe–3; woodland suitability group 8.

Wilkes fine sandy loam, 15 to 35 percent slopes (WmF).—This soil is in areas that adjoin major waterways and streams. It is a little shallower, but in other respects its profile is similar to the one described as representative for the series.

Included with this soil in mapping were areas that have numerous outcrops and areas of soils that have a stony surface layer. These areas are indicated by special symbols on the soil map. Also included were a few areas of very steep soils.

Runoff is very rapid to rapid, and the hazard of erosion is very severe.

Nearly all of the acreage is wooded. Cleared areas are used for pasture or have been planted to pines. This soil is not suited to cultivated crops. A good use is for woodland or fescue pasture. Capability unit VIIe–1; woodland suitability group 8.

Wilkes soils, 4 to 10 percent slopes, severely eroded (WnC3).—These soils are in small areas scattered throughout the county. Nearly all of the original surface layer has been removed by erosion, and the present surface layer ranges from fine sandy loam to clay but is mainly yellowish-brown clay loam. In other respects these soils have a profile similar to the one described as representative for the series.

Included with these soils in mapping were small areas of soils that are not severely eroded and that have a fine sandy loam surface layer. There are bedrock outcrops in some places, and in other places the soil is very shallow over bedrock. Also included were a few areas of Iredell soils.

Runoff is medium to rapid, and the hazard of further erosion is severe.

Most of the acreage is wooded. Cleared areas are used mostly for pasture. These soils are unsuited to cultivated crops. A better use is for hay, pasture, or woodland. Capability unit VIe–3; woodland suitability group 9.

Wilkes soils, 10 to 35 percent slopes, severely eroded (WnF3).—These soils are in areas scattered throughout the county. Generally, the surface layer is yellowish-brown clay loam, but it ranges from fine sandy loam to clay. Nearly all of the original surface layer has been removed by erosion, but in other respects the profile is similar to the one described as representative for the series.

Included with these soils in mapping were small areas of soils that have numerous stones on the surface and numerous bedrock outcrops. These areas are indicated by special symbols on the soil map. There are a few small areas of soils that are not severely eroded, and in these the surface layer is fine sandy loam.

Runoff is rapid to very rapid, and the hazard of further erosion is very severe.

Nearly all of the acreage is wooded or has been planted to pines. A small acreage has been cleared and is used for pasture. These soils are not suited to cultivated crops. A good use is for woodland or fescue pasture. Capability unit VIIe–1; woodland suitability group 9.

Worsham Series

The Worsham series consists of deep, poorly drained, nearly level soils that have a grayish, mottled, clayey subsoil. These soils occur in depressions at the heads of drainageways, at the bases of slopes, and on upland flats. They formed in local colluvial and alluvial sediment washed from the associated soils. Most of the associated soils formed in residuum from granite, schist, and gneiss.

In a representative profile, the surface layer is silt loam 9 inches thick. It is dark brown in the upper 2 inches and grayish brown in the main part. The subsoil, which extends to a depth of 48 inches, is mainly light brownish-gray clay mottled with yellowish brown. The substratum is mottled, light-gray clay mixed with weathered rock fragments.

These soils have a strongly acid to very strongly acid subsoil. They are low in natural fertility. Permeability is moderately slow to very slow, and available water capacity is medium.

Represenative profile of Worsham silt loam in an area of Worsham soils, in a low-lying wooded area near Drakes Branch, 1 mile east of junction of State Highway No. 654 and State Highway No. 59, along south side of Highway No. 59:

A1—0 to 2 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; many fine roots; strongly acid; abrupt, smooth boundary.

A2—2 to 9 inches, grayish-brown (2.5Y 5/2) silt loam, weak, fine, granular structure; very friable; few fine and medium roots; few fine concretions; strongly acid; clear, smooth boundary.

B1g—9 to 13 inches, grayish-brown (2.5Y 5/2) silty clay loam; few, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, angular blocky structure; friable, slightly sticky and slightly plastic; few fine concretions; strongly acid; clear, smooth boundary.

B2tg—13 to 38 inches, light brownish-gray (2.5Y 6/2) clay; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, angular blocky structure; very firm, sticky and plastic; few fine concretions; few fine mica flakes; strongly acid; gradual, smooth boundary.

B3g—38 to 48 inches, light brownish-gray (2.5Y 6/2) clay; many, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, angular blocky structure; very firm, sticky and plastic; few fine quartz fragments; few fine mica flakes; strongly acid; clear, smooth boundary.

Cg—48 to 60 inches, light-gray (5Y 7/1) clay; many, medium, distinct, yellowish-brown mottles; massive; shows original rock structure; very firm; many fine quartz fragments; strongly acid.

The A1 horizon is dark brown to very dark gray. In the A2 horizon the hue ranges from 2.5Y to 10YR; value is 5 or 6, and chroma is 2 or less. The A horizon is dominantly silt loam but ranges to fine sandy loam. The Bt horizon ranges from 2.5Y to 10YR in hue; its value is 5 or more, and its chroma is 2 or less. Mottles are dominantly yellowish brown, but olive-brown and olive mottles are common. Texture of the B horizon ranges from heavy clay loam to clay, and structure is generally weak. The C horizon is typically gray and massive or shows original rock structure. Some profiles have a gravelly stratum below the B3 horizon. The solum ranges from about 42 to 52 inches in thickness. Depth to bedrock ranges from 6 feet to more than 8 feet. Few fine mica flakes and few fine to medium concretions are throughout most profiles. Reaction is strongly acid to very strongly acid.

Worsham soils are similar to the Colfax, Helena, and Roanoke soils. They have a lower content of silt in the Bt horizon

than Roanoke soils. They differ from the Colfax soils in lacking a fragipan, and from Helena soils in having grayer color in the subsoil.

Worsham soils are commonly near Appling, Cecil, Colfax, Georgeville, Helena, Herndon, Orange, and Vance soils. Worsham soils are grayer throughout the subsoil and are more poorly drained than all of those soils. They contain less silt than the Georgeville, Herndon, and Orange soils.

Worsham soils (Wo).—These nearly level soils occur throughout the county in areas at the heads of drainageways, in depressional areas, and on upland flats. These soils have a profile similar to the one described as repretative for the series, but the surface layer ranges from silt loam to fine sandy loam.

Included in mapping were small areas of soils that have a fragipan beneath the subsoil. In some places a few inches of recently deposited alluvium is on the surface, and in other places the profile shows thin strata of sand and gravel.

Runoff is slow, and the hazard of erosion is slight. During wet periods, a water table is within a few inches of the surface.

Most areas of these soils are wooded. Some cleared areas are used for pasture, and a few areas are used for cultivated crops. The soils are poorly suited to cultivated crops and are not commonly used for them. They are better suited to fescue grown for pasture or to trees. Capability unit Vw–1; woodland suitability group 2.

Worsham Series, Fragipan Variant

The Worsham series, fragipan variant, consists of poorly drained soils that have a hard, compact fragipan in or below a clayey subsoil. These soils formed in alluvial or colluvial sediment washed from the surrounding soils. They are nearly level and occur at the heads of drainageways or on upland flats and depressions throughout the county.

In a representative profile, the surface layer is fine sandy loam that is about 12 inches thick and is mainly light brownish gray. The subsoil, to a depth of 26 inches, is light-gray and dark-gray clay mottled with yellowish brown. This is underlain by a fragipan of light-gray, compact light clay loam about 10 inches thick. The fragipan restricts the movement of water and the penetration of roots. The substratum is light-gray, friable fine sandy loam.

These soils have a strongly acid to very strongly acid subsoil. They are low in natural fertility. Permeability is slow, and the available moisture capacity is medium.

Representative profile of a Worsham fine sandy loam, fragipan variant, in woodland southeast of Keysville, one-fourth mile west of the county line on State Highway No. 629 and 100 yards south of the road:

A1—0 to 1 inch, very dark gray (10YR 3/1) fine sandy loam, weak, fine, granular structure; very friable; abundant roots; strongly acid; abrupt, smooth boundary.

A2—1 to 9 inches, light brownish-gray (2.5Y 6/2) fine sandy loam; weak, fine, granular structure; very friable; few fine and medium roots; strongly acid; clear, smooth boundary.

A3—9 to 12 inches, light-gray (N 7/0) fine sandy loam; many, fine, prominent, brownish-yellow (10YR 6/6) mottles; weak, fine, granular structure; very friable; few medium roots; strongly acid; clear, smooth boundary.

B21tg—12 to 19 inches, light-gray (5Y 6/1) clay; many, medium, prominent mottles of yellowish brown (10YR 5/8); weak, medium, angular blocky structure; firm, sticky and plastic; few thin clay films; strongly acid; clear, wavy boundary.

B22tg—19 to 26 inches, dark-gray (N 5/0) clay; many, medium, prominent mottles of yellowish brown (10YR 5/8); weak, medium, angular blocky structure; very firm, very sticky and very plastic; few thin clay films; strongly acid; clear, smooth boundary.

Bx—26 to 36 inches, light-gray (N 6/0) light clay loam; moderate, medium, clayey structure; compact, brittle; 15 to 20 percent fine gravel; strongly acid.

IICg—36 to 52 inches, light-gray (10YR 7/1) fine sandy loam; many, fine, distinct, yellow (10YR 7/6) mottles; massive; friable; very strongly acid.

The A2 horizon ranges from 2.5Y to 10YR in hue; its value is 5 or 6, and its chroma is 2 or less. Texture ranges from fine sandy loam to silt loam, and thickness from 6 to 10 inches. The A3 horizon has a hue of neutral to 5Y or 10YR; its value is 5 or more, and its chroma is 2 or less. Mottles are dominantly yellowish brown, but olive brown and olive are common. Texture of the Bt horizon ranges from heavy clay loam to clay. Depth to the fragipan ranges from 24 to 36 inches and thickness of the fragipan from 8 to 12 inches; its color is dominantly gray or light gray, and its texture is loam to light clay loam. The C horizon is dominantly light gray or gray, and the texture ranges from sandy loam to clay. In places there are strata of gravelly material. The solum ranges from 32 to 52 inches in thickness. Depth to hard rock is more than 5 feet. Reaction is strongly acid or very strongly acid if the soil is not limed.

Worsham soils, fragipan variant, are similar to the Colfax, Roanoke, and Worsham soils. They have a grayer profile than Colfax soils and are more poorly drained. They differ from the Roanoke and Worsham soils in having a fragipan.

Worsham soils, fragipan variant, are commonly near Appling, Cecil, Georgeville, Herndon, and Vance soils. They differ from all of those soils in being poorly drained. In addition, they have a gray, mottled subsoil and also have a fragipan.

Worsham soils, fragipan variant (Wr).—These nearly level soils are in areas at the heads of drainageways or upland depressions. The surface layer ranges from fine sandy loam to silt loam, and in some small areas the surface layer consists of thin layers of recently deposited alluvium. Included in mapping were small areas of soils that have thin strata of sand and gravel in the profile.

Runoff is slow, and the hazard of erosion is slight. During wet periods, a water table is within a few inches of the surface. These soils are not suited to cultivated crops. They are suited to pasture or woodland. Capability unit Vw–1; woodland suitability group 2.

Use and Management of the Soils

This section has several main parts. It describes management of the soils for crops and pasture and gives facts about woodland and wildlife in the county. It also describes use of the soils for engineering purposes and for community developments and recreation.

Management for Crops and Pasture

General principles of soil management are described in the following pages. The system of capability classification used by the Soil Conservation Service is explained, and use and management of the soils in each capability unit are discussed. Finally, estimated yields to be expected when a high level of management is used are given.

General principles of soil management

Some principles of management are general enough to apply to the soils on all the farms in the survey area,

though the individual soils or groups of soils require different kinds and degrees of management. These general principles of management are discussed in the following paragraphs. The management of specified groups of soils is discussed in the subsection "Management by Capability Units."

On many soils in the survey area, additions of lime, fertilizer, or both, are needed, the amounts depending on the natural content of lime and plant nutrients, on past cropping and management, on the need of the crop, and on the level of yield desired. Suggestions for additions of lime and fertilizer are only general in this survey because such additions should be based on laboratory analyses of soil samples.

The soils of Charlotte County are naturally quite low in content of organic matter, and building up this content is not economical. It is important, however, to maintain a supply of organic matter by adding farm manure, by leaving plant residue on the surface, and by using other practices that insure extensive root systems and vigorous growth.

Tillage is needed to prepare a seedbed and to control weeds, but it should be kept to a minimum because it generally tends to break down the structure of the soil. Also helpful in preventing a breakdown of structure are adding organic matter and growing sod crops, cover crops, and green-manure crops.

All of the sloping cultivated soils in the survey area are susceptible to erosion and to loss of organic matter and plant nutrients from the surface layer. Because most erosion occurs when the cultivated crop is growing, or soon after the crop has been harvested, a cropping sequence should be selected that keeps the loss of soil and water to a minimum. This cropping sequence is most effective if it is used with one or more other practices of erosion control. These practices are contour farming, terracing, strip-cropping, construction of diversions, grassing of waterways, using minimum tillage, using crop residue effectively, seeding cover crops, and applying fertilizer and lime if needed.

On most wet soils in the survey area, yields of cultivated crops can be increased by removing excess water through open ditches or tile drains. Tile drains are expensive to install, though they generally provide better drainage than open ditches. Soils that have a fragipan are difficult to drain, but they can be drained better by open ditches than by tile. Open ditches are most effective if they intercept the water as it moves horizontally on top of the pan. For drainage by either tile or open ditches, suitable outlets are required.

Capability grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The soils are grouped according to their limitations when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive land-forming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to horticultural crops or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or engineering.

In the capability system, the kinds of soil are grouped at three levels: the capability class, the subclass, and the unit. These are discussed in the following paragraphs.

Capability Classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, defined as follows:

Class I soils have few limitations that restrict their use. (None in Charlotte County.)

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.

Class V soils are subject to little or no erosion but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife habitat.

Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife habitat.

Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland or wildlife habitat.

Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife habitat, or water supply, or to esthetic purposes. (None in Charlotte County.)

Capability Subclasses are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States but not in Charlotte County, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife habitat, or recreation.

Capability Units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and

other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe–4 or IIIe–5. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass.

In the following pages the capability units in Charlotte County are described and suggestions for the use and management of the soils are given.

Management by capability units [2]

The capability units in Charlotte County are described in this part of the survey. The names of soil series represented are mentioned in the description of each capability unit, but this does not mean that all the soils of a given series appear in that unit. To find the capability classification of any given mapping unit, refer to the "Guide to Mapping Units" at the back of this survey.

CAPABILITY UNIT IIe–1

This capability unit consists of gently sloping to sloping, slightly eroded and moderately eroded soils. In the general order of their suitability for the commonly grown crops, these soils are of the Appling, Masada, Mayodan, Grover, Wedowee, Herndon, and Vance series. They are deep to moderately deep, well-drained soils that have medium to high available water capacity and moderate to slow permeability. The surface layer ranges from silt loam to fine gravelly sandy loam, and the subsoil is light clay loam to clay. These soils are low in content of organic matter and low in natural fertility. Reaction is very strongly acid to strongly acid.

These soils have a wide range of suitability for the field crops and the pasture and hay plants grown in the county (fig. 6). They are especially well suited to bright tobacco. Crops are easy to establish and respond well to high levels of fertilization. These soils are well suited to the use of sprinkler irrigation.

[2] J. H. VADEN, conservation agronomist, Soil Conservation Service, helped to prepare this section.

Figure 6.—Alfalfa on a gently sloping Appling soil of capability unit IIe–1.

Erosion is a slight to moderate hazard. The soils can be farmed intensively, however, if modern conservation practices are used.

CAPABILITY UNIT IIe–2

This capability unit consists of gently sloping, well-drained, deep or moderately deep, eroded Enon and Mecklenburg soils. These soils are on broad ridges in the uplands. They have a surface layer of friable fine sandy loam or loam and a firm, clayey subsoil that is slowly permeable. Natural fertility is low to medium, available water capacity is medium, and reaction is neutral to slightly acid.

The subsoil of heavy clay and the slow internal drainage limit the suitability of these soils for crops. These soils can be worked only within a rather narrow range of moisture content. Therefore, planting of crops may be delayed in spring. Nevertheless, these soils are fairly well suited to corn, small grain, and soybeans, and they are well suited to all the hay and pasture plants grown locally, except alfalfa. The soils are not well suited to bright tobacco, and they have limitations that make them poorly suited to sprinkler irrigation. The hazard of further erosion is great enough that effective practices are needed to control erosion.

CAPABILITY UNIT IIe–3

This capability unit consists of gently sloping soils that formed in local colluvium and of alluvial soils on low terraces along the major streams. In the general order of their suitability for the commonly grown crops, these soils are of the Starr, State, Wickham, Abell, and Altavista series. They are deep, well drained to moderately well drained soils that have moderate to moderately rapid permeability and medium to very high available water capacity. The surface layer ranges from friable silt loam to fine sandy loam. The subsoil is friable to firm loam to sandy clay loam or silty clay loam. These soils are medium to low in content of organic matter and in natural fertility. Reaction is slightly acid to very strongly acid.

Favorable slope and good available water capacity make the soils in this unit well suited to the grain and forage crops grown in the county. These soils are especially well suited to summer annuals, such as sorghum or sudangrass. Except for alfalfa, all of the locally grown hay and pasture plants grow well on these soils. Alfalfa does not grow well where there is a fluctuating water table.

Erosion is only a minor hazard, and these soils can be farmed intensively if modern conservation practices are used.

CAPABILITY UNIT IIe–4

This capability unit consists of gently sloping, slightly eroded and moderately eroded soils. In the general order of their suitability for the commonly grown crops, these soils are of the Cullen, Turbeville, Madison, Cecil, Pacolet, and Georgeville series. They are deep and well drained, have a medium available water capacity, and are moderately permeable. The surface layer is friable fine sandy loam, fine gravelly sandy loam, loam, or silt loam. The subsoil ranges from heavy clay loam to clay. Natural fertility and content of organic matter are medium to low, and reaction is medium acid to very strongly acid.

Soils in this unit are among the better soils on uplands and high terraces in the county for growing grain and

forage crops. The soils are well suited to corn, small grain, and soybeans. Also, they are well suited to such hay and pasture plants as alfalfa, red clover (fig. 7), ladino clover, orchardgrass, and tall fescue.

The hazard of erosion is slight to moderate. If management is good, the soils can be farmed intensively and protected from erosion by practices that permit the use of multiple-row equipment.

CAPABILITY UNIT IIw–1

This capability unit consists of nearly level, deep, well drained to moderately well drained Altavista, Congaree, and Toccoa soils. Also in the unit is Alluvial land. These soils are on first bottoms, on low stream terraces, and in low colluvial areas. They have a surface layer that ranges from very friable silt loam to fine sandy loam and a subsoil that is friable silt loam, fine sandy loam, or light clay loam. Permeability is moderately rapid to moderate, and available water capacity is high to low. Natural fertility and the content of organic matter are low to medium. Reaction is strongly acid to slightly acid.

Under good management, these soils are especially well suited to grain and forage crops because they are in areas of favorable terrain and have good available water capacity. With the exception of alfalfa, these soils are well suited to all locally grown grasses and legumes. They are especially well suited to summer annuals, such as sorghum and sudangrass.

Erosion generally is not a hazard on these soils. The soils are limited either by infrequent flooding or by a fluctuating water table. If good agronomic practices are followed, these soils are suitable for continuous cropping systems.

CAPABILITY UNIT IIIe–1

This capability unit consists mainly of sloping soils in the Altavista, Appling, Grover, Herndon, Masada, Mayodan, Vance, Wedowee, and Wickham series. A gently sloping Wilkes soil also is in the unit because it is so erodible. Except for the Wilkes, these soils are moderately deep to deep, moderately well drained to well drained, and moderate to slow in permeability. They are low to medium in natural fertility, low in content of organic matter, and very strongly acid to strongly acid. Their available water capacity is medium to high. The surface layer of these soils is fine sandy loam to fine gravelly sandy loam, and the subsoil is heavy clay loam to clay. The Wilkes soil in this unit is well drained, medium acid to neutral, and low in available water capacity.

Figure 7.—**Red clover on a gently sloping Cecil soil.**

Under proper management, these soils are suited to most of the field crops and the pasture and hay plants grown in the county. Where erosion is controlled, they are especially well suited to bright tobacco. Crops are easy to establish, and they respond well to high levels of fertilization. The soils are well suited to the use of sprinkler irrigation.

The principal limitation to use of these soils for crops is erodibility because of slope.

CAPABILITY UNIT IIIe–2

This capability unit consists of nearly level to gently sloping, moderately well drained to somewhat poorly drained Creedmoor, Helena, Iredell, and Orange soils. The surface layer ranges from friable silt loam to fine gravelly sandy loam, and the subsoil is clay. Permeability is slow to very slow, and the available water capacity is medium. Natural fertility is low to medium. Reaction is neutral to very strongly acid.

These soils are limited in their suitability for crops. They are better suited to small grain than to the other field crops that are commonly grown. They are only fair to poor for corn and soybeans. Some tobacco is grown on the Helena and Creedmoor soils, which produce well under good management. Because they have a plastic subsoil, the soils in this unit are not well suited to alfalfa. Tall fescue and ladino clover are the better suited pasture plants.

Erosion is a hazard on these soils. Selection of the better suited crops, seeding suitable grasses and legumes, and the removal of excess water by surface drainage are all effective practices of management. Practices are generally needed for controlling erosion.

CAPABILITY UNIT IIIe–3

This capability unit consists of the sloping soils of the Enon and Mecklenburg series. These soils are deep to moderately deep and are well drained. They have a fine sandy loam or loam surface layer and a firm clayey subsoil that is slowly permeable. Natural fertility is low to medium, and available water capacity is medium. Reaction is neutral to slightly acid.

Both the heavy clay subsoil and the sloping terrain limit the suitability of these soils for crops. The soils are fairly well suited to corn, small grain, and soybeans if erosion is controlled. In some years the planting of spring crops is delayed because the heavy clay subsoil limits the range of moisture conditions under which these soils can be worked. These soils are not well suited to bright tobacco and have limitations to the use of sprinkler irrigation. Except for alfalfa, they are well suited to the hay and pasture plants grown locally.

Erosion is a severe hazard if the soils in this unit are used for cultivated crops. They are poorly suited to the intensive use of multiple-row farm equipment.

CAPABILITY UNIT IIIe–4

This capability unit consists of sloping, slightly eroded to moderately eroded soils of the Cecil, Cullen, George-

ville, Madison, Mecklenburg, Pacolet, and Turbeville series. They are deep, well-drained soils that have medium available water capacity and moderate to slow permeability. The surface layer is friable and ranges from fine gravelly sandy loam to silt loam. The subsoil ranges from heavy silty clay loam to clay. Natural fertility and the content of organic matter are medium to low. Reaction is slightly acid to very strongly acid.

If properly managed, these soils are especially well suited to grain and forage crops. Because of slope, they have serious limitations for intensive use. Where erosion is controlled, these soils are well suited to corn, small grain, soybeans, and all locally grown hay and pasture plants. They are especially well suited to alfalfa but generally are not used for bright tobacco.

Because of slope, erosion is a severe hazard if these soils are used for cultivated crops. The soils have limitations that restrict the intensive use of multiple-row farm equipment.

CAPABILITY UNIT IIIe–5

This unit is made up of the gently sloping, severely eroded Cecil, Cullen, Georgeville, Herndon, Madison, and Turbeville soils. These soils are deep and well drained. Their present surface layer is silty clay loam or clay loam. The soils have moderate permeability and medium to high available water capacity. The content of organic matter is low, and natural fertility is medium to low. Reaction is medium acid to very strongly acid.

These soils cannot be used intensively for field crops, because they have been severely eroded. Nevertheless, if properly managed, they can be successfully used for most grain, hay, and pasture crops grown in the county. They are not suited to bright tobacco. The eroded surface layer makes the establishment of most crops difficult.

Because of past erosion and the hazard of further erosion, conservation practices are necessary to the successful sustained use of these soils.

CAPABILITY UNIT IIIw–1

This capability unit consists of nearly level to gently sloping, moderately well drained to somewhat poorly drained soils that are deep over bedrock. These soils are of the Augusta, Chewacla, and Colfax series. The Augusta soils are on low stream terraces, the Chewacla soil is on first bottoms, and the gently sloping Colfax soil is on uplands. All of these soils formed in alluvial or colluvial material. The surface layer ranges from silt loam to fine sandy loam, and the subsoil ranges from loam to silty clay loam. These soils are low to medium in content of organic matter, very strongly acid to medium acid in reaction, and low to high in natural fertility. Permeability is moderate to slow, and the available water capacity is low to high.

Erosion is a minor hazard only on the gently sloping Augusta soils. The use of the Chewacla soil is limited by wetness and frequent flooding.

If the soils in this unit are well managed, they are well suited to grain and forage crops. Because of a seasonal high water table and restricted drainage, they are not well suited to alfalfa; however, they are well suited to all other hay and pasture plants grown in the county. They can be especially suitable for summer annuals, such as sorghum and sudangrass.

These soils are suited to continuous cropping systems if good agronomic practices are followed and good drainage and protection from flooding are provided. Where tile drainage is effective, the Augusta and Chewacla soils are suited to sprinkler irrigation.

CAPABILITY UNIT IIIs–1

Only Buncombe loamy sand and the Buncombe-Toccoa complex are in this capability unit. These are nearly level, deep, excessively drained to well-drained, sandy soils on flood plains. The surface layer is mostly very friable, loose loamy sand or fine sandy loam that is underlain mostly by unconsolidated sand, loamy sand, or fine sandy loam. Permeability is rapid to moderately rapid, and the available water capacity is medium to low. These soils are low in content of organic matter and low to medium in natural fertility. They are strongly acid to slightly acid.

Droughtiness and frequent flooding are limiting factors in the use of these soils. Erosion is not a concern. Even under good management, these soils have limited suitability for corn, small grain, mixed hay, and most other crops grown in the county. They have some potential for truck crops, especially melons. Heavy fertilization and the addition of organic matter are essential to the productive use of these soils.

CAPABILITY UNIT IVe–1

This capability unit consists of deep to moderately deep, well-drained, slowly permeable and moderately permeable soils. These sloping to moderately steep soils are of the Appling, Cecil, Cullen, Georgeville, Grover, Herndon, Madison, Masada, Mecklenburg, Pacolet, Turbeville, and Vance series. The sloping soils are severely eroded, and the moderately steep soils are mostly moderately eroded. Natural fertility and available water capacity range from medium to low, and the content of organic matter is low. Reaction is strongly acid to neutral. Texture of both the surface layer and subsoil varies, but crop production on these soils is generally favorable, except where the soils are severely eroded.

The use of these soils for crops is seriously limited by slope and the hazard of erosion. Nevertheless, if the soils are properly managed, they can be used for most of the field crops and hay and pasture plants that are grown in the county. They have very severe limitations for intensive use, however. The hazard of erosion is such that hay and pasture are generally the safest uses. If the soils are used for field crops, practices are needed for the control of erosion.

CAPABILITY UNIT IVe–2

This capability unit consists of soils of the Creedmoor, Enon, Helena, Iredell, and Orange series. These soils have a very slowly permeable to slowly permeable, heavy, plastic clay subsoil and are either severely eroded or are gently sloping to sloping. These combinations of characteristics seriously limit the use of these soils for crops. The soils are somewhat poorly drained to well drained. They are low to medium in the content of organic matter, very strongly acid to neutral in reaction, and low to medium in natural fertility. They have a medium available water capacity.

Even though these soils have a limited suitability for most crops, they are well suited to small grain. They are

poorly suited to corn and only fairly well suited to mixed hay plants. The plastic subsoil makes them unsuited to alfalfa. A good use is for hay or pasture.

The heavy subsoil makes these soils difficult to cultivate except within a narrow range of moisture content. In addition, wetness can be a concern and surface drainage may be required. The hazard of erosion is such that applicable practices are needed for controlling erosion. These soils are not suitable for sprinkler irrigation.

CAPABILITY UNIT IVe–3

Well-drained to excessively drained, sloping soils of the Goldston, Louisburg, Pinkston, and Wilkes series are in this unit. These shallow to moderately deep soils are on uplands. They have a weakly defined subsoil that has moderately slow to rapid permeability. Natural fertility is low to medium, the content of organic matter is low, and available water capacity is low to very low. Reaction is very strongly acid to neutral.

These soils have only limited suitability for the field crops, grasses, and legumes grown in the county. The erosion hazard is very severe, and the soils tend to be droughty. Where erosion can be controlled, the Louisburg and Wilkes soils are sometimes used for bright tobacco. Hay or pasture is generally a good use. If these soils are used for crops, practices are needed for the control of erosion.

CAPABILITY UNIT IVw–1

This capability unit consists of deep, somewhat poorly drained to poorly drained Wehadkee soils and the Wehadkee-Chewacla complex. These soils are on flood plains. They have a friable silt loam or fine sandy loam surface layer and a mottled, loamy subsoil. Permeability is moderate, and available water capacity is medium to high. Organic-matter content and natural fertility also are medium to high. These soils are medium acid to very strongly acid.

Unless a fairly complete drainage system is provided, these soils are very limited in their use as cropland. Installation of tile drains and establishing diversion ditches at the base of slopes have aided in making these soils suitable for grain and forage crops on some farms. Without flood protection these soils are subject to frequent overflow. If a surface drainage system is used, these soils generally can be used productively for pasture.

CAPABILITY UNIT Vw–1

This capability unit consists of deep, poorly drained Roanoke and Worsham soils on stream terraces, along drainageways, and in upland depressions. The surface layer ranges from silt loam to fine sandy loam, and the subsoil generally is plastic clay. Some of the Worsham soils are underlain by a fragipan. Permeability is very slow to moderately slow, and the available water capacity is medium. The content of organic matter is low, and natural fertility is low. Reaction is strongly acid to very strongly acid.

These soils have a high water table and lack drainage outlets. Therefore, the soils generally are not suitable for cultivation. They are suitable for pasture if surface drainage is provided. Tall fescue and ladino clover are the better suited pasture plants for use on these soils.

CAPABILITY UNIT VIe–1

This capability unit consists of deep, well-drained, moderately permeable, sloping to moderately steep soils that are severely eroded. These soils are of the Appling, Cecil, Madison, and Pacolet series. They are low in organic matter and are strongly acid to very strongly acid. Natural fertility is low, and available water capacity is medium. The surface layer generally is clay loam, and the subsoil is heavy clay loam to clay.

Slope and the hazard of erosion limit the use of these soils to grass or trees unless the most complex practices are used for controlling erosion.

If properly managed, the soils of this unit can be used productively for perennial hay and pasture. In establishing the hay and pasture plants, care should be exercised to control soil losses. Management practices are needed that provide for a productive cover of desirable grasses and legumes. The soils of this unit are well suited to use as woodland.

CAPABILITY UNIT VIe–2

Sloping, moderately well drained to somewhat poorly drained soils of the Iredell and Orange series are in this unit. These soils have a surface layer of silt loam or loam and a subsoil of slowly permeable, heavy, plastic clay. The soils are medium in available water capacity, low to medium in natural fertility, and neutral to strongly acid in reaction.

Slope and the heavy plastic subsoil limit the use of these soils to grass or trees, unless the most complex management is used.

If properly managed, these soils are fairly well suited to most hay and pasture plants, except alfalfa. Establishment of permanent hay or pasture on these soils is difficult because the soils can be cultivated only within a very narrow range of moisture content. Also, erosion is a major concern until a protective cover is established. Management is needed that provides for a protective and productive cover of desirable grasses and legumes. These soils are limited in their suitability as woodland.

CAPABILITY UNIT VIe–3

This unit consists of sloping to moderately steep, dominantly shallow to moderately deep soils. These soils are of the Goldston, Louisa, Louisburg, Pinkston, and Wilkes series. Also in the unit is the moderately steep Mecklenburg loam, loamy subsoil variant, which is moderately deep to deep and has a light clay loam to loam subsoil. Most of the soils in this unit have a weakly defined subsoil. Permeability ranges from moderately slow to rapid. The soils are neutral to very strongly acid and are medium to low in natural fertility and content of organic matter. The capacity of these soils to hold water available for use by plants is low to very low.

Slope and the lack of adequate soil depth limit the use of these soils to grass or trees, except under the most complex management. The suitability of these soils for any use is only fair to poor.

If properly managed, these soils can be used for perennial hay or pasture. In establishing the plants, care should be exercised to control erosion. Good management of pasture and hayland is necesasry to maintain a protective and

suitable cover. These soils are only fairly well suited to use as woodland.

CAPABILITY UNIT VIIe-1

This capability unit consists of dominantly shallow to moderately deep soils that are so limited by either slope or erosion, or both, that they are not considered suitable for field crops, even under the best management. These soils are of the Goldston, Louisa, Louisburg, and Wilkes series. Also in the unit is the Gullied land-Cecil complex.

A good use of these soils is for trees or wildlife habitat, and in a few places they can be used for pasture if the best practices are used in establishing and maintaining a plant cover.

Estimated yields

Table 2 gives estimates of the average acre yields of the principal crops grown on the soils of Charlotte County. The level of management needed to obtain these yields includes the application of lime and fertilizer in the amounts and at the times currently recommended by the Virginia Agricultural Experiment Station; the control of soil erosion, weeds, and plant insects and diseases; the use of a suitable cropping system and the return of crop residue to the soil; draining the soil where needed; proper preparation of the seedbed; and the proper grazing of pastures.

TABLE 2.—*Estimated average acre yields of the principal crops grown under a high level of management*

[Dashes indicate that the crop is not commonly grown or that the soil is not suited to the crop]

Soil	Corn	Soybeans	Wheat	Bright tobacco	Alfalfa	Mixed hay	Pasture
	Bu.	*Bu.*	*Bu.*	*Lbs.*	*Tons*	*Tons*	*Cow-acre-days* [1]
Abell soils, 2 to 6 percent slopes	120	45	40	----------	3. 0	3. 5	200
Alluvial land	110	35	40	----------	4. 0	3. 5	220
Altavista fine sandy loam, 0 to 2 percent slopes	120	45	45	----------	2. 0	3. 5	210
Altavista fine sandy loam, 2 to 6 percent slopes	110	45	45	(2)	3. 5	3. 5	200
Altavista fine sandy loam, 6 to 10 percent slopes, eroded	90	30	40	----------	3. 0	3. 0	180
Appling clay loam, 4 to 10 percent slopes, severely eroded	60	20	25	----------	3. 0	2. 5	150
Appling clay loam, 10 to 20 percent slopes, severely eroded	----------	----------	20	----------	2. 5	2. 0	120
Appling fine gravelly sandy loam, 2 to 6 percent slopes, eroded	100	35	45	(2)	4. 5	3. 5	200
Appling fine gravelly sandy loam, 6 to 15 percent slopes, eroded	80	30	40	----------	4. 5	3. 0	180
Appling fine gravelly sandy loam, 15 to 25 percent slopes, eroded	----------	----------	20	----------	2. 5	2. 0	120
Appling fine sandy loam, 2 to 6 percent slopes, eroded	100	35	45	(2)	4. 5	3. 5	200
Appling fine sandy loam, 6 to 10 percent slopes	90	30	40	(2)	3. 5	3. 0	180
Appling fine sandy loam, 6 to 15 percent slopes, eroded	60	20	30	----------	3. 0	2. 5	150
Appling fine sandy loam, 15 to 25 percent slopes, eroded	----------	----------	----------	----------	2. 0	2. 0	120
Appling fine sandy loam, very deep, 2 to 6 percent slopes, eroded	100	35	35	(2)	3. 5	3. 0	180
Appling fine sandy loam, very deep, 6 to 15 percent slopes, eroded	90	30	30	(2)	3. 0	2. 5	150
Augusta fine sandy loam, 0 to 2 percent slopes	110	40	30	----------	----------	3. 5	210
Augusta fine sandy loam, 2 to 6 percent slopes	100	35	30	----------	----------	3. 5	210
Buncombe loamy sand	70	25	25	----------	----------	2. 0	120
Buncombe-Toccoa complex	70	25	25	----------	2. 0	3. 0	180
Cecil fine gravelly sandy loam, 2 to 6 percent slopes, eroded	100	35	45	(2)	5. 5	3. 5	210
Cecil fine gravelly sandy loam, 6 to 15 percent slopes, eroded	90	30	40	----------	5. 0	3. 0	200
Cecil fine gravelly sandy loam, 15 to 25 percent slopes, eroded	----------	----------	25	----------	3. 0	2. 5	180
Cecil fine sandy loam, 2 to 6 percent slopes, eroded	110	35	50	(2)	5. 5	3. 5	210
Cecil fine sandy loam, 6 to 15 percent slopes, eroded	90	30	45	----------	5. 0	3. 0	180
Cecil fine sandy loam, 15 to 25 percent slopes, eroded	----------	----------	----------	----------	3. 0	2. 0	150
Cecil fine sandy loam, very deep, 2 to 6 percent slopes, eroded	110	35	50	(2)	5. 5	3. 5	210
Cecil fine sandy loam, very deep, 6 to 15 percent slopes, eroded	90	30	45	----------	5. 0	3. 0	180
Cecil fine sandy loam, very deep, 15 to 25 percent slopes, eroded	----------	----------	----------	----------	3. 0	2. 0	150
Cecil clay loam, 2 to 6 percent slopes, severely eroded	70	25	30	----------	4. 0	3. 0	180
Cecil clay loam, 6 to 15 percent slopes, severely eroded	60	20	25	----------	3. 5	2. 0	150
Cecil clay loam, 15 to 25 percent slopes, severely eroded	----------	----------	----------	----------	3. 0	2. 0	120

See footnotes at end of table.

TABLE 2.—*Estimated average acre yields of the principal crops grown under a high level of management*—Continued

Soil	Corn	Soybeans	Wheat	Bright tobacco	Alfalfa	Mixed hay	Pasture
	Bu.	*Bu.*	*Bu.*	*Lbs.*	*Tons*	*Tons*	*Cow-acre-days* [1]
Cecil clay loam, very deep, 2 to 6 percent slopes, severely eroded	80	25	35		4. 0	3. 0	180
Cecil clay loam, very deep, 6 to 15 percent slopes, severely eroded	70	20	30		3. 5	2. 0	150
Chewacla silt loam	120	40	30			3. 5	210
Colfax fine sandy loam, 2 to 6 percent slopes	80	25	25			3. 0	180
Congaree silt loam	140	45	35		5. 5	4. 0	240
Creedmoor sandy loam, 2 to 6 percent slopes, eroded	80	25	25	[2]		3. 0	120
Creedmoor sandy loam, 6 to 10 percent slopes, eroded	60	20	20			2. 5	90
Cullen loam, 2 to 6 percent slopes, eroded	130	45	50		6. 0	4. 0	220
Cullen loam, 6 to 15 percent slopes, eroded	120	35	45		5. 5	3. 5	200
Cullen loam, 15 to 25 percent slopes, eroded					4. 0	3. 0	180
Cullen clay loam, 2 to 6 percent slopes, severely eroded	100	30	40		4. 0	3. 0	180
Cullen clay loam, 6 to 15 percent slopes, severely eroded			25		3. 5	2. 0	120
Enon fine sandy loam, 2 to 6 percent slopes, eroded	100	35	45		4. 0	3. 5	180
Enon fine sandy loam, 6 to 10 percent slopes, eroded	70	25	40		3. 5	3. 0	150
Enon clay loam, 4 to 12 percent slopes, severely eroded			25		3. 5	2. 5	120
Georgeville silt loam, 2 to 6 percent slopes, eroded	100	35	45		5. 5	3. 5	200
Georgeville silt loam, 6 to 15 percent slopes, eroded	80	25	40		5. 0	3. 0	180
Georgeville silt loam, 15 to 25 percent slopes, eroded					3. 0	2. 0	120
Georgeville silty clay loam, 2 to 6 percent slopes, severely eroded	60	20	30		4. 0	3. 0	180
Georgeville silty clay loam, 6 to 15 percent slopes, severely eroded			20		3. 0	2. 5	120
Goldston silt loam, 4 to 10 percent slopes	60	20	25		3. 5	2. 0	150
Goldston silt loam, 10 to 15 percent slopes					3. 0	1. 0	120
Goldston silt loam, 15 to 35 percent slopes						1. 0	90
Grover sandy loam, 2 to 6 percent slopes, eroded	90	35	45	[2]	5. 0	4. 0	200
Grover sandy loam, 6 to 15 percent slopes, eroded	70	30	40		4. 5	3. 0	180
Gullied land-Cecil complex, moderately steep							
Helena fine gravelly sandy loam, 2 to 6 percent slopes	80	25	25			3. 0	180
Helena fine gravelly sandy loam, 6 to 10 percent slopes, eroded	60	20				2. 5	120
Helena fine sandy loam, 2 to 6 percent slopes, eroded	80	25	25			3. 0	180
Helena fine sandy loam, 6 to 10 percent slopes, eroded	60	20				2. 5	120
Herndon silt loam, 2 to 6 percent slopes, eroded	90	30	40	[2]	3. 5	3. 0	200
Herndon silt loam, 6 to 15 percent slopes, eroded	70	25	30		3. 0	2. 5	180
Herndon silty clay loam, 2 to 6 percent slopes, severely eroded	60	20	25		2. 5	2. 0	150
Herndon silty clay loam, 6 to 15 percent slopes, severely eroded						2. 0	120
Iredell loam, 2 to 6 percent slopes	80	25	30			3. 0	200
Iredell loam, 2 to 6 percent slopes, eroded	60	20	25			2. 5	180
Iredell loam, 6 to 10 percent slopes, eroded						2. 0	120
Louisa fine sandy loam, 6 to 15 percent slopes	70	30	40		4. 0	3. 0	180
Louisa fine sandy loam, 15 to 35 percent slopes						2. 0	120
Louisa and Louisburg soils, 15 to 25 percent slopes, severely eroded						2. 0	120
Louisburg sandy loam, 4 to 10 percent slopes	70	30	25		2. 0	2. 0	120
Louisburg sandy loam, 10 to 15 percent slopes						1. 0	90
Louisburg sandy loam, 15 to 35 percent slopes							90
Madison fine sandy loam, 2 to 6 percent slopes, eroded	120	40	45		5. 5	3. 5	210
Madison fine sandy loam, 6 to 15 percent slopes, eroded	110	35	40		5. 0	3. 0	180
Madison clay loam, 2 to 6 percent slopes, severely eroded	100	30	40		4. 0	3. 0	180
Madison clay loam, 6 to 15 percent slopes, severely eroded	80	20	25		3. 5	2. 0	150
Madison and Grover fine sandy loams, 15 to 25 percent slopes, eroded					3. 0	2. 0	120
Masada fine sandy loam, 2 to 6 percent slopes, eroded	110	35	45	[2]	4. 5	3. 0	200
Masada fine sandy loam, 6 to 15 percent slopes, eroded	80	30	40		3. 5	3. 0	180
Masada fine sandy loam, 15 to 25 percent slopes					2. 0	2. 0	120
Mayodan sandy loam, 2 to 6 percent slopes, eroded	100	35	40	[2]	3. 5	2. 5	150

See footnotes at end of table.

TABLE 2.—*Estimated average acre yields of the principal crops grown under a high level of management*—Continued

Soil	Corn	Soybeans	Wheat	Bright tobacco	Alfalfa	Mixed hay	Pasture
	Bu.	*Bu.*	*Bu.*	*Lbs.*	*Tons*	*Tons*	*Cow-acre-days* [1]
Mayodan sandy loam, 6 to 15 percent slopes, eroded	60	20	25		2. 5	1. 0	120
Mecklenburg loam, 2 to 6 percent slopes, eroded	100	35	50		4. 0	3. 0	200
Mecklenburg loam, 6 to 12 percent slopes, eroded	80	30	40		3. 5	2. 5	180
Mecklenburg loam, loamy subsoil variant, 2 to 6 percent slopes	100	35	50		4. 0	3. 0	200
Mecklenburg loam, loamy subsoil variant, 6 to 10 percent slopes	80	30	40		3. 5	2. 5	180
Mecklenburg loam, loamy subsoil variant, 10 to 25 percent slopes					2. 5	1. 0	120
Mecklenburg loam, loamy subsoil variant, 10 to 25 percent slopes, severely eroded						1. 0	90
Orange silt loam, 2 to 6 percent slopes	60	25	35			2. 5	120
Orange silt loam, 2 to 6 percent slopes, eroded	60	25	35			2. 5	120
Orange silt loam, 6 to 10 percent slopes, eroded			20			1. 0	90
Pacolet fine sandy loam, 2 to 6 percent slopes, eroded	90	30	40		4. 0	3. 0	180
Pacolet fine sandy loam, 6 to 15 percent slopes, eroded	70	25	30		3. 0	2. 5	150
Pacolet fine sandy loam, 15 to 25 percent slopes, eroded					2. 0	1. 0	120
Pacolet clay loam, 4 to 10 percent slopes, severely eroded	70	25	30		3. 0	2. 5	150
Pacolet clay loam, 10 to 15 percent slopes, severely eroded					2. 0	1. 0	120
Pinkston fine sandy loam, 6 to 10 percent slopes						2. 0	120
Pinkston fine sandy loam, 10 to 25 percent slopes						1. 0	90
Roanoke silt loam						2. 0	180
Starr loam, 2 to 6 percent slopes	140	45	45		4. 5	4. 0	240
State silt loam, 2 to 6 percent slopes	140	45	45		5. 5	4. 0	240
Toccoa fine sandy loam	120	35	45		4. 5	3. 5	220
Turbeville fine sandy loam, 2 to 6 percent slopes, eroded	130	45	50		6. 0	4. 0	220
Turbeville fine sandy loam, 6 to 15 percent slopes, eroded	120	35	45		5. 5	3. 5	200
Turbeville fine sandy loam, 15 to 35 percent slopes, eroded					4. 0	3. 0	180
Turbeville clay loam, 2 to 6 percent slopes, severely eroded	100	30	40		4. 0	3. 0	180
Turbeville clay loam, 6 to 15 percent slopes, severely eroded			25		3. 5	2. 0	120
Vance fine gravelly sandy loam, 2 to 6 percent slopes, eroded	90	30	40	[2]	2. 5	2. 5	180
Vance fine gravelly sandy loam, 6 to 15 percent slopes, eroded	70	25	30		2. 0	2. 0	150
Vance fine sandy loam, 2 to 6 percent slopes, eroded	90	30	40		2. 5	2. 5	180
Vance fine sandy loam, 6 to 10 percent slopes, eroded	70	25	30		2. 0	2. 0	150
Vance fine sandy loam, 10 to 15 percent slopes, eroded						1. 0	120
Wedowee fine sandy loam, 2 to 6 percent slopes, eroded	80	30	40	[2]	4. 0	2. 5	180
Wedowee fine sandy loam, 6 to 15 percent slopes, eroded			25		3. 0	1. 0	120
Wehadkee fine sandy loam, overwash	80	25	25			3. 0	200
Wehadkee silt loam	60	20	20			2. 5	180
Wehadkee-Chewacla complex	90	30	25			3. 5	210
Wickham fine sandy loam, 2 to 6 percent slopes	125	35	45		5. 5	3. 5	220
Wickham fine sandy loam, 6 to 10 percent slopes, eroded	100	30	40		4. 0	3. 0	180
Wilkes fine sandy loam, 2 to 6 percent slopes	80	25	30		3. 5	2. 0	120
Wilkes fine sandy loam, 6 to 15 percent slopes	60	20	25		2. 5	1. 0	120
Wilkes fine sandy loam, 15 to 35 percent slopes							90
Wilkes soils, 4 to 10 percent slopes, severely eroded	60	20	25		2. 5	1. 0	120
Wilkes soils, 10 to 35 percent slopes, severely eroded							90
Worsham soils							120
Worsham soils, fragipan variant							120

[1] The number of days in a year that 1 acre will support 1 cow, steer, or horse; 5 hogs; or 7 sheep or goats without damage to the pasture.

[2] One of the best soils for bright tobacco. Yields of 1,800 to 2,200 pounds of quality tobacco can be expected. Dark tobacco is also grown in this county, and the yields are essentially the same as those for bright tobacco where dark tobacco is grown on soils that yield 100 bushels or more per acre of corn.

Yield data were obtained from farmers, from reports of agricultural workers in this and surrounding counties, and from observations of soil scientists who conducted the soil survey.

Use of the Soils as Woodland [3]

The original woodland cover on uplands of Charlotte County consisted of oak, yellow-poplar, maple, hickory, blackgum, black locust, dogwood, black walnut, shortleaf pine, and Virginia pine. On the bottom lands of the county, the original woodland was made up of ash, oak, yellow-poplar, maple, black walnut, sycamore, river birch, elm, and sweetgum.

Most of the original woodland was harvested before 1920. Effective fire control and other management practices are now in use. Many fields and cutover woodland areas have been planted to pine, and this practice continues. The annual growth of trees now exceeds the annual timber cut. Woodland products are an important source of income in Charlotte County.

Large and small tracts of woodland are scattered throughout the county, and these tracts make up about 65 percent of the total acreage. The larger tracts of woodland are mainly on steep, shallow soils that occupy areas near the major streams. The soils in these areas are mainly of the Goldston, Louisa, Louisburg, Pinkston, and Wilkes series.

Soil properties have a strong influence on species adaptation, tree growth, and woodland management. Differences in the depth and texture of the soil material for example, affect the available moisture capacity and thereby influence the growth of trees. Other features, such as slope, also account for differences in the growth of trees and in the management of the stand. The soils have been grouped to help owners apply proper woodland management.

Woodland suitability groups

The soils of Charlotte County have been placed in 11 woodland suitability groups, as shown in table 3. Each group is composed of soils that produce similar kinds of wood crops, that need similar management to produce these crops, and that have about the same potential productivity. Some of the terms used to describe these suitability groups are defined as follows:

Preferred species refers to naturally occurring species that would be managed for wood crops. This listing is not intended to be in order of preference.

Site index refers to the height, in feet, that dominant trees in a stand attain in 50 years. These figures are based on measurements, field observations, and estimates by foresters in the State of Virginia.

The hazards and limitation that affect management are explained in the following paragraphs.

Seedling mortality refers to the expected degree of failure for natural seedlings or planted stock. Such losses are influenced by kind of soil, degree of erosion, or other site factors. *Slight* mortality means that the expected loss is in the range of 0 to 25 percent of seedlings or planted stock; *moderate* means that the expected loss is 26 to 50 percent; and *severe* means that the expected loss is more than 50 percent.

Equipment limitation refers to restrictions in the use of woodland equipment on soils of the group. Ratings indicate the degree to which soil and topographic features restrict or prohibit the use of equipment commonly used in preparation for tree planting and tree harvesting. The limitation is *slight* if there are no restrictions on the type of equipment or on the time of year that the equipment can be used. It is *moderate* if the slopes are moderately steep; if the use of heavy equipment is restricted by wetness in winter and early in spring; or if the use of equipment damages the roots of trees to some extent. The limitation is *severe* if many types of equipment cannot be used; if equipment severely damages the roots of trees and the structure and stability of the soils; or if slopes are steep or moderately steep or the soils are stony and contain rock outcrops.

Plant competition refers to the invasion or growth of undesirable plants where openings are made in the crown canopy of trees. Plant competition is *slight* where it will not prevent adequate natural or artificial regeneration of desirable species; it is *moderate* where it will delay but not prevent natural or artificial regeneration; and it is *severe* where it will delay but not prevent adequate or artificial regeneration without intensive site preparation and maintenance treatments, such as weeding.

Erosion hazard refers to the potential of soil erosion that may occur after cutting of timber and where the soil is exposed along roads, skid trails, fire lanes, and areas where logs are decked. The hazard is *slight* if no special erosion control practices are needed, as on slopes of 0 to 2 percent, and only a small loss of soil material is expected. The hazard is *moderate* if a moderate amount of soil material is lost where runoff is not controlled and the vegetation is not adequate for protection. The hazard is *severe* where the slopes are steep, runoff is rapid, infiltration and permeability are slow, and past erosion makes the soils more susceptible to further erosion.

Windthrow hazard is related to soil characteristics that control tree root development and, therefore, the firmness with which the roots anchor the tree in the soil. The hazard of windthrow is *slight* where all individual trees are expected to remain standing in commonly occurring winds; the hazard is *moderate* where root development is adequate and trees will remain standing except during periods of excessive soil wetness or in strong wind velocities; the hazard is *severe* where tree roots do not give adequate stability and individual trees would be blown over if released on all sides.

Soil Interpretations for Wildlife Habitat [4]

The wildlife populations of any area depend primarily on the availability of food, cover, and water in a suitable combination (*1*). The lack of any of these requirements, an unfavorable balance between them, or an inadequate distribution of them can seriously limit or make impossible the use of a tract as a habitat for desired species of wildlife.

[3] L. W. KEMPF, woodland specialist, Soil Conservation Service, helped prepare this section.

[4] By R. F. DUGAN, biologist, Soil Conservation Service.

TABLE 3.—*Preferred species, potential productivity, and management hazards and limitations by woodland suitability groups of soils*

[The symbol > means more than; the symbol < means less than]

Woodland suitability group, description of soils, and map symbols	Preferred species in existing stands growing on soils in group [1]	Site index for preferred species	Seedling mortality	Equipment limitation	Plant competition	Hazard of—	
						Erosion	Windthrow
		Feet					
Group 1: Deep, well-drained to somewhat poorly drained soils on bottom lands, on terraces, and in upland depressions; slopes as much as 6 percent; medium to high available water capacity. AbB; Ad; Cn; Cr; SrB; StB; WlB.	Loblolly pine	>85	Slight	Slight to moderate.	Moderate	Slight	Slight.
	Virginia pine	60–69					
	Red and white oaks	>75					
	Yellow-poplar	85–99					
	Sweetgum	85–99					
Group 2: Deep, poorly drained to somewhat poorly drained soils on bottom lands, on low terraces, and in upland depressions; slopes as much as 3 percent; medium to high available water capacity. Ro; We, Wh, Wk; Wo; Wr.	Loblolly pine	75–84	Slight or severe. [2]	Severe	Moderate to severe.	Slight	Slight.
	Red and white oaks	65–74					
	Virginia pine	60–69					
	Sweetgum	75–85					
Group 3: Deep, moderately well drained to somewhat poorly drained soils on low terraces and weakly concave to plane uplands; slopes as much as 10 percent; medium to high available water capacity. AfA, AfB, AfC2; AuA, AuB; CoB.	Loblolly pine	75–84	Slight	Moderate	Moderate	Slight	Slight.
	Virginia pine	60–69					
	Red and white oaks	55–64					
	Shortleaf pine	60–69					
Group 4: Deep, well-drained soils on uplands; slopes as much as 25 percent; low natural fertility, medium to high available water capacity. AgB2, AgD2, AgE2, AlB2, AlC, AlD2, AlE2, AmB2, AmD2; CcB2, CcD2, CcE2, CeB2, CeD2, CeE2, CfB2, CfD2, CfE2; CuB2, CuD2, CuE2; GeB2, GeD2, GeE2; GrB2, GrD2; HnB2, HnD2; MaB2, MaD2, MdE2; MeB2, MeD2, MeE; MfB2, MfD2; PaB2, PaD2, PaE2; TuB2, TuD2, TuF2; WdB2, WdD2, WlC2.	Loblolly pine	75–84	Slight	Slight to moderate.	Slight to moderate.	Slight to moderate.	Slight.
	Yellow-poplar	[3] 85–99					
	Red and white oaks	65–74					
	Virginia pine	60–69					
	Shortleaf pine	60–69					
Group 5: Deep to moderately deep, well-drained, severely eroded soils on uplands; slopes as much as 25 percent; medium available water capacity. ApC3, ApE3; ClB3, ClD3, ClE3, CmB3, CmD3; CvB3, CvD3; EoC3; GgB3, GgD3; GuE; HrB3, HrD3; McB3, McD3; MlE3; PcC3, PcD3; TvB3, TvD3.	Loblolly pine	65–74	Slight to moderate.	Moderate to severe.	Slight	Moderate to severe.	Slight to moderate.
	Virginia pine	50–59					
	Shortleaf pine	50–59					
	Red and white oaks	<55					

See footnotes at end of table.

TABLE 3.—*Preferred species, potential productivity, and management hazards and limitations by woodland suitability groups of soils*—Continued

Woodland suitability group, description of soils, and map symbols	Preferred species in existing stands growing on soils in group[1]	Site index for preferred species	Seedling mortality	Equipment limitation	Plant competition	Hazard of—	
						Erosion	Windthrow
		Feet					
Group 6: Deep to moderately deep, well-drained soils that formed in material weathered from mixed basic and acidic rocks on uplands; slopes as much as 25 percent; moderate natural fertility; medium available water capacity. EnB2, EnC2; MkB2, MkC2, MlB, MlC, MlE.	Loblolly pine Virginia pine Shortleaf pine Red and white oaks Yellow-poplar	65–74 50–59 50–59 55–64 <70	Slight	Moderate.	Slight	Slight to moderate.	Slight.
Group 7: Deep, moderately well drained and well drained soils on uplands; slopes as much as 15 percent; slow or very slow permeability; medium available water capacity. CsB2, CsC2; HeB, HeC2, HfB2, HfC2; VaB2, VaD2, VcB2, VcC2, VcD2.	Loblolly pine Virginia pine Red and white oaks	65–74 50–59 55–64	Slight	Slight to moderate.	Slight	Slight to moderate.	Slight.
Group 8: Shallow to moderately deep, well-drained to excessively drained soils on uplands; slopes as much as 35 percent; low or very low available water capacity. GoC, GoD, GoF; LoD, LoF, LsE3; LuC, LuD, LuF; PkC, PkE; WmB, WmD, WmF.	Loblolly pine Virginia pine Shortleaf pine Red and white oaks	65–74 60–69 50–59 55–64	Moderate.	Slight to severe.[4]	Slight	Slight to severe.[4]	Moderate.
Group 9: Shallow to moderately deep, well-drained to excessively drained, severely eroded soils on uplands; slopes as much as 35 percent; very low available water capacity. WnC3, WnF3.	Loblolly pine Virginia pine Shortleaf pine Red and white oaks	<65 <50 <50 <55	Moderate.	Moderate to severe.	Slight	Moderate to severe.	Slight.
Group 10: Moderately deep to deep, moderately well drained to somewhat poorly drained soils on uplands; slopes as much as 10 percent; fine-textured, slowly permeable subsoil; moderate natural fertility; medium available water capacity. IrB, IrB2, IrC2; OrB, OrB2, OrC2.	Loblolly pine Virginia pine Shortleaf pine Red and white oaks	65–74 50–59 50–59 <55	Slight	Moderate.	Slight	Slight	Slight.
Group 11: Deep, well-drained to excessively drained soils on bottom lands; slopes less than 3 percent; rapid or moderately rapid permeability; low to medium available water capacity. Bn, Bt; To.	Loblolly pine Shortleaf pine Virginia pine Red and white oaks Yellow-poplar	>85 60–69 60–69 65–74 85–100	Slight	Slight	Moderate.	Slight	Slight.

[1] Loblolly pine is the preferred species to plant in all woodland suitability groups, but yellow-poplar is also a preferred species to plant in suitability group 4.

[2] Seedling mortality for Wehadkee-Chewacla complex and Wehadkee silt loam are rated slight; that for other soils in the group is rated severe.

[3] The site index for yellow-poplar on Herndon and Georgeville soils is 70 to 84.

[4] Erosion hazard and equipment limitation depend on soil slope; the rating is slight on slopes of 0 to 10 percent; it is moderate on slopes of 10 to 15 percent; and it is severe on slopes of more than 15 percent.

Most wildlife habitats are created, improved, or maintained by establishing and manipulating vegetation, and by providing food and water in suitable places. Information about the soils is essential in carrying out these measures. Such information is also useful in broad-scale planning for parks, nature areas, or other recreational or educational developments in which wildlife populations are important. It is an important aid in planning for the acquisition of land for development of wildlife habitat or protection of wildlife.

Interpretations of the suitability of soils for wildlife habitat are helpful in selecting sites that are adaptable to wildlife management and in determining the level of management needed to achieve satisfactory results. Interpretations may also reveal reasons that make a particular area unsuitable for a specific kind of wildlife. Table 4 rates the soils of Charlotte County according to their suitability for eight elements of wildlife habitat and also for three broad classes of wildlife.

Habitat suitability ratings

Meanings of the numerical ratings used in table 4 are as follows: 1, well suited (above average); 2, suited (average); 3, poorly suited (below average); and 4, not suited (not practical).

Well suited means that habitats generally are easily created, improved, or maintained; that the soil has few or no limitations that affect management; and that satisfactory results can be expected. *Suited* means that habitats can be created, improved, or maintained in most places; that the soil has moderate limitations that affect management; and that moderate intensity of management and fairly frequent attention may be required for satisfactory results. *Poorly suited* means that habitats can be created, improved, or maintained in most places; that the soil has rather severe limitations; that habitat management is difficult and expensive, requiring intensive effort; and that results are not always satisfactory. *Not suited* means that under present levels of economy and technology, creating, improving, or maintaining habitats is impractical or impossible and that unsatisfactory results are probable.

Habitat elements

The eight elements of wildlife habitats listed in table 4 are described in the following paragraphs:

Grain and seed crops refer to domestic grains or other seed-producing annuals planted to produce wildlife food. Examples are corn, sorghum, wheat, oats, barley, millet, buckwheat, cowpeas, soybeans, and sunflower.

Grasses and legumes refer to domestic perennial grasses and herbaceous legumes that are planted for wildlife food or cover. Examples are fescue, bluegrass, lovegrass, switchgrass, bromegrass, timothy, orchardgrass, clover, alfalfa, trefoil, and crownvetch.

Wild herbaceous upland plants are native or naturally established grasses and forbs (weeds) that provide food and cover, principally to upland forms of wildlife. Examples are bluestem grasses, indiangrass, goldenrod, beggarweed, partridgepea, pokeweed, dandelion, and wild strawberry.

Hardwood trees, shrubs, and vines are nonconiferous woody plants that produce nuts or other fruits, buds, catkins, twigs, bark, or foliage used extensively as food by wildlife. Many of these plants have secondary value as nesting or escape cover. They are commonly established naturally but may be planted or transplanted. Examples are oak, beech, hickory, cherry, dogwood, wild plum, hawthorn, grape, honeysuckle, viburnum, greenbrier, rose, blackberry, and blueberry.

Coniferous woody plants refer to cone-bearing trees and shrubs that furnish cover for wildlife or supply food in the form of browse, seeds, or fruitlike cones. They are commonly established through natural processes but may be planted or transplanted. Examples are pine, spruce, hemlock, fir, yew, cedar, and juniper.

Wild herbaceous wetland plants are annual and perennial wild herbaceous plants that grow on moist to wet sites, exclusive of submerged or floating aquatic plants, that produce food or cover used extensively by wetland forms of wildlife. Examples are smartweed, wild millet, rush, sedge, reed, wildrice, cutgrass, cordgrass, saltgrass, and cattail.

Shallow water developments are areas of surface water having an average depth of less than 5 feet that contain or are near wildlife food and cover. They may be created by dams or levees, sometimes in combination with some excavation, or by water-control devices in marshes or streams. They are distinguished from excavated ponds by the fact that they always include some means of controlling the water level at or above the natural water table. Examples are muskrat marshes, waterfowl feeding areas, wildlife watering developments, wildlife ponds, and beaver ponds.

Shallow excavated ponds are areas of surface water having a depth of less than 5 feet that contain or are near wildlife food and cover. They may be created by blasting or other excavation, but they do not provide for storage of water above the natural water table. Examples are blasted potholes, dugouts for waterfowl, level ditches, and excavated wildlife ponds or watering facilities.

Kinds of wildlife

The three kinds of wildlife listed in table 4 are defined as follows:

Openland wildlife refers to birds and mammals that normally live on cropland, pasture, meadow, lawns, and areas overgrown by grasses, herbs, and vines or shrubby growth. Examples of such wildlife species are quail, pheasant, meadowlark, field sparrow, killdeer, cottontail rabbit, red fox, and woodchuck. Ratings in this column are a weighted average of the ratings for grain and seed crops; grasses and legumes; wild herbaceous upland plants; and hardwood trees, shrubs, and vines.

Woodland wildlife refers to the birds and mammals that live in wooded areas. Such areas may contain either hardwood trees and shrubs, coniferous tree and shrubs, or a mixture of these. Examples of woodland wildlife are wild turkey, ruffed grouse, woodcock, thrush, vireo, woodpecker, squirrel, gray fox, raccoon, white-tailed deer, and black bear. Ratings in this column are a weighted average of the ratings for grasses and legumes; wild herbaceous upland plants; hardwood trees, shrubs, and vines; and coniferous woody plants.

Wetland wildlife refers to birds and mammals that live in swamps, marshes, or areas of open water. Examples are ducks, geese, herons, shore birds, rails, kingfisher, muskrat, mink, beaver, and otter. Ratings in this column are

TABLE 4.—*Suitability of soils for elements of wildlife habitat and for kinds of wildlife*

[Numerals have the following meanings: 1, well suited; 2, suited; 3, poorly suited; and 4, not suited]

Soil series and map symbols	Elements of wildlife habitat								Kinds of wildlife		
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood trees, shrubs, and vines	Coniferous woody plants	Wild herbaceous wetland plants	Shallow water developments	Shallow excavated ponds	Openland	Woodland	Wetland
Abell: AbB	2	1	1	1	1	3	4	4	1	1	3
Alluvial land: Ad	2	1	1	1	1	3	3	3	1	1	2
Altavista:											
AfA	2	1	1	1	1	3	3	3	1	1	2
AfB	2	1	1	1	1	3	3	3	1	1	2
AfC2	2	1	1	1	1	3	4	4	1	1	3
Appling:											
AgB2, AlB2, AmB2	2	1	1	1	1	4	4	4	1	1	4
AgD2, AlC, AlD2, AmD2	2	1	1	1	1	4	4	4	1	1	4
AgE2, AlE2	3	2	1	1	1	4	4	4	2	1	4
ApC3	2	2	2	1	1	4	4	4	2	1	4
ApE3	3	2	2	1	1	4	4	4	2	1	4
Augusta:											
AuA	2	2	1	1	1	3	2	2	2	1	2
AuB	2	2	1	1	1	3	3	3	2	1	2
Buncombe: Bn, Bt	3	3	3	3	3	4	4	4	3	3	4
Cecil:											
CcB2, CcD2, CeB2, CeD2, CfB2, CfD2	2	1	1	1	1	4	4	4	1	1	4
CcE2, CeE2, CfE2	3	2	1	1	1	4	4	4	2	1	4
ClB3, CmB3	2	2	2	1	1	4	4	4	2	1	4
ClD3, CmD3	2	2	2	1	1	4	4	4	2	1	4
ClE3	3	2	2	1	1	4	4	4	2	1	4
Chewacla: Cn	2	2	1	1	1	2	2	3	2	1	2
Colfax: CoB	2	2	1	1	1	4	3	3	2	1	3
Congaree: Cr	2	1	1	1	1	4	4	4	1	1	4
Creedmoor: CsB2, CsC2	2	2	1	1	1	4	3	3	2	1	3
Cullen:											
CuB2, CuD2	2	1	1	1	1	4	4	4	1	1	4
CuE2	3	2	2	1	1	4	4	4	2	1	4
CvB3, CvD3	2	2	2	1	1	4	4	4	2	1	4
Enon:											
EnB2, EnC2	2	1	1	1	1	4	4	4	1	1	4
EoC3	2	2	2	1	1	4	4	4	2	1	4
Georgeville:											
GeB2, GeD2	2	1	1	1	1	4	4	4	1	1	4
GeE2	3	2	1	1	1	4	4	4	2	1	4
GgB3, GgD3	2	2	2	1	1	4	4	4	2	1	4
Goldston:											
GoC, GoD	3	3	3	4	4	4	4	4	3	4	4
GoF	4	3	3	4	4	4	4	4	3	4	4
Grover: GrB2, GrD2	2	1	1	1	1	4	4	4	1	1	4
Gullied land-Cecil complex: GuE	4	3	2	2	2	4	4	4	3	2	4
Helena: HeB, HeC2, HfB2, HfC2	2	2	1	1	1	4	3	3	2	1	3
Herndon:											
HnB2, HnD2	2	1	1	1	1	4	4	4	1	1	4
HrB3, HrD3	2	2	2	1	1	4	4	4	2	1	4
Iredell: IrB, IrB2, IrC2	2	1	1	1	1	4	3	3	1	1	3
Louisa: LoD, LoF, LsE3	4	3	3	4	4	4	4	4	3	4	4
Louisburg:											
LuC, LuD	3	3	3	4	4	4	4	4	3	4	4
LuF	4	3	3	4	4	4	4	4	3	4	4
Madison:											
MaB2, MaD2	2	1	1	1	1	4	4	4	1	1	4
McB3, McD3	2	2	2	1	1	4	4	4	2	1	4
MdE2	3	2	1	1	1	4	4	4	2	1	4
Masada:											
MeB2, MeD2	2	1	1	1	1	4	4	4	1	1	4
MeE	3	2	1	1	1	4	4	4	2	1	4
Mayodan: MfB2, MfD2	2	1	1	1	1	4	4	4	1	1	3
Mecklenburg: MkB2, MkC2	2	1	1	1	1	4	4	4	1	1	3

TABLE 4.—*Suitability of soils for elements of wildlife habitat and for kinds of wildlife*—Continued

Soil series and map symbols	Elements of wildlife habitat								Kinds of wildlife		
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood trees, shrubs, and vines	Coniferous woody plants	Wild herbaceous wetland plants	Shallow water developments	Shallow excavated ponds	Openland	Woodland	Wetland
Mecklenburg, loamy subsoil variant: MIB, MIC, MIE, MIE3	3	3	2	3	3	4	4	4	3	3	4
Orange: OrB, OrB2, OrC2	2	2	1	1	1	4	3	3	2	1	3
Pacolet:											
PaB2, PaD2	2	1	1	1	1	4	4	4	1	1	4
PcC3, PcD3	2	2	2	1	1	4	4	4	1	1	4
PaE2	3	2	1	1	1	4	4	4	2	1	4
Pinkston: PkC, PkE	3	3	3	4	4	4	4	4	3	4	4
Roanoke: Ro	3	2	2	1	2	3	1	1	2	1	2
Starr: SrB	2	1	1	1	1	4	4	4	1	1	4
State: StB	2	1	1	1	1	4	4	4	1	1	4
Toccoa: To	3	2	1	1	1	4	4	4	2	1	4
Turbeville:											
TuB2, TuD2	2	1	1	1	1	4	4	4	1	1	4
TuF2	4	2	1	1	1	4	4	4	2	1	4
TvB3, TvD3	2	2	2	1	1	4	4	4	1	1	4
Vance: VaB2, VaD2, VcB2, VcC2, VcD2	2	1	1	1	1	4	4	4	1	1	4
Wedowee: WdB2, WdD2	2	1	1	1	1	4	4	4	1	1	4
Wehadkee: We, Wh, Wk	3	2	2	1	2	2	2	4	2	1	2
Wickham: WIB, WIC2	2	1	1	1	1	4	4	4	1	1	4
Wilkes: WmB, WmD, WmF, WnC3, WnF3	4	3	3	4	4	4	4	4	3	4	4
Worsham: Wo, Wr	3	2	2	1	2	1	2	4	2	1	1

obtained by averaging the rating for wild herbaceous wetland plants with the rating for one type of shallow water, or in some instances averaging the rating for shallow water developments with that for grain and seed crops.

It should be emphasized that the ratings of soil mapping units for the production of habitat elements are much more accurate for planning and site selection than are the ratings for the three kinds of wildlife. The latter are broad generalizations and should be treated as such.

Engineering Uses of the Soils [5]

This section is useful to those who need information about soils used as structural material or as foundation upon which structures are built. Some of those who can benefit from this section are planning commissions, town, and city managers, land developers, engineers, contractors, and farmers.

Among the properties of soils highly important in engineering are permeability, strength, compaction characteristics, drainage, shrink-swell potential, grain size, plasticity, and reaction. Also important are slope and depth to the water table and to bedrock. These properties, in various degrees and combinations, affect construction and maintenance of roads, airports, pipelines, foundations for small buildings, irrigation systems, ponds and small dams, and systems for disposal of sewage and refuse.

[5] R. A. GALLO, conservation engineer, Soil Conservation Service, assisted in preparing this section.

Information in this section of the soil survey can be helpful to those who—

1. Select potential residential, industrial, commercial, and recreational areas.
2. Evaluate alternate routes for roads, highways, pipelines, and underground cables.
3. Seek sources of gravel, sand, or clay.
4. Plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for controlling water and conserving soil.
5. Correlate performance of structures already built with properties of the kinds of soil on which they are built, for the purpose of predicting performance of structures on the same or similar kinds of soil in other locations.
6. Predict the trafficability of soils for cross-country movement of vehicles and construction equipment.
7. Develop preliminary estimates pertinent to construction in a particular area.

Most of the information in this section is presented in tables. Table 5 shows estimated soil properties significant to engineering; table 6, interpretations for various engineering uses; and table 7, results of engineering laboratory tests on selected soil samples. This information, along with the soil map and other parts of this publication, can be used to make interpretations in addition to those given in tables 5 and 6. It also can be used to make other useful maps.

TABLE 5.—*Estimated soil properties*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil, and that to another series in the first column of this table. The symbol >

Soil series and map symbols	Depth to—		Depth from surface (typical profile)	Classification		
	Bedrock	Seasonal high water table		USDA texture	Unified	AASHO
	Feet	*Feet*	*Inches*			
Abell: AbB	>4	2–3	0–18	Fine sandy loam	SM	A–4
			18–45	Clay loam, silty clay loam.	ML–CL	A–6
			45–55	Silty clay	CL	A–7
Alluvial land: Ad	>10	>3	(2)	(2)	(2)	(2)
Altavista: AfA, AfB, AfC2	>5	2–3	0–11	Fine sandy loam	SM	A–4, A–2
			11–42	Sandy clay loam, light clay loam.	ML–CL, SC	A–6
			42–52	Light clay loam	ML–CL, SC	A–6
Appling:						
ApC3, ApE3	>5	>5	0–7	Clay loam	ML–CL	A–6
			7–50	Light clay loam, heavy clay loam, clay.	MH	A–7
			50–66	Clay loam	CL, MH	A–6, A–7
AgB2, AgD2, AgE2	>5	>5	0–11	Fine gravelly sandy loam	SM	A–2, A–4
			11–52	Light clay loam, heavy clay loam, clay.	MH	A–7
			52–72	Clay loam	CL, MH	A–6, A–7
AlB2, AlC, AlD2, AlE2, AmB2, AmD2.	>5	>5	0–9	Fine sandy loam	SM	A–4, A–2
			9–56	Light clay loam, heavy clay loam, clay.	MH	A–7
			56–72	Clay loam	CL, MH	A–6, A–7
Augusta: AuA, AuB	>4	1–2	0–7	Fine sandy loam	SM	A–4
			7–60	Sandy clay loam, light clay loam, clay.	ML–CL, MH	A–6, A–7
			60–72	Gravelly clay loam	ML–CL	A–6
*Buncombe: Bn, Bt	>10	>4	0–9	Loamy sand	SM	A–2
For Toccoa part of Bt, see Toccoa series.			9–72	Fine and medium sand	SM	A–2
Cecil:						
CcB2, CcD2, CcE2	>5	>5	0–8	Fine gravelly sandy loam.	SM	A–2, A–4
			8–42	Clay loam, clay	MH	A–7
			42–68	Clay loam	CL, MH	A–6, A–7
CeB2, CeD2, CeE2, CfB2, CfD2, CfE2.	>5	>5	0–8	Fine sandy loam	SM	A–4, A–2
			8–42	Clay loam, clay	MH	A–7
			42–68	Clay loam	CL, MH	A–6, A–7
ClB3, ClD3, ClE3, CmB3, CmD3	>5	>5	0–7	Clay loam	ML–CL	A–6
			7–36	Clay loam, clay	MH	A–7
			36–62	Clay loam	CL, MH	A–6, A–7
Chewacla: Cn	>4	1–2	0–8	Silt loam	ML	A–4
			8–52	Heavy silt loam	ML	A–4
			52–72	Loamy sand	SM	A–2
Colfax: CoB	>4	1–2	0–7	Fine sandy loam	SM	A–4
			7–32	Sandy clay loam, clay loam.	ML–CL	A–6
			32–44	Heavy loam fragipan	ML	A–4
			44–52	Loam	ML	A–4
Congaree: Cr	>10	>4	0–8	Silt loam	ML	A–4
			8–72	Silt loam	ML	A–4

See footnotes at end of table.

significant to engineering

these soils may have different properties and limitations. For this reason the reader should carefully follow the instructions for referring means more than; the symbol < means less than]

Percentage less than 3 inches passing sieve—				Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosion potential	
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)					Uncoated steel	Concrete
				Inches per hour	*Inches per inch of soil*	*pH*			
95–100	95–100	70–85	40–50	2. 0–6. 3	0. 12–0. 14	4. 5–5. 5	Low	(1)	(1).
95–100	95–100	90–100	70–80	2. 0–6. 3	0. 14–0. 18	4. 5–5. 5	Moderate	Moderate	Moderate to high.
85–100	85–100	80–100	75–95	0. 63–2. 0	0. 12–0. 16	4. 5–5. 5	Moderate	High	Moderate to high.
(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2).
100	90–100	65–85	35–50	2. 0–6. 3	0. 12–0. 14	5. 1–6. 0	Low	(1)	(1).
100	95–100	85–95	40–75	0. 63–2. 0	0. 14–0. 18	5. 1–6. 0	Moderate	Moderate	Moderate.
100	95–100	80–90	40–75	0. 63–2. 0	0. 14–0. 18	5. 1–6. 0	Moderate	Moderate	Moderate.
90–100	85–90	75–90	60–75	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Moderate	(1)	(1).
95–100	85–95	75–90	65–85	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	High	High to moderate.
95–100	85–95	70–95	70–80	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Moderate	Moderate	High to moderate.
95–100	75–85	50–70	30–40	2. 0–6. 3	0. 08–0. 14	4. 5–5. 5	Low	(1)	(1).
95–100	85–95	75–90	60–85	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	High	High to moderate.
95–100	85–95	70–90	60–70	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Moderate	Moderate	High to moderate.
90–100	85–90	55–80	35–50	2. 0–6. 3	0. 12–0. 14	4. 5–5. 5	Low	(1)	(1).
95–100	85–95	75–90	65–85	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	High	High to moderate.
95–100	85–95	70–95	60–75	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Moderate	Moderate	High to modearte.
100	95–100	65–80	40–50	2. 0–6. 3	0. 12–0. 14	5. 1–6. 0	Low	(1)	(1).
100	95–100	85–95	50–80	0. 63–2. 0	0. 14–0. 18	5. 1–6. 0	Moderate	High	Moderate.
95–100	75–85	65–75	50–65	0. 20–0. 63	0. 10–0. 14	5. 1–6. 0	Moderate	High	Moderate.
100	100	50–75	15–30	6. 3–20. 0	0. 06–0. 08	5. 1–6. 0	Low	(1)	(1).
100	100	50–80	20–35	6. 3–20. 0	0. 06–0. 08	5. 1–6. 0	Low	Low	Moderate to high.
95–100	75–85	50–70	30–40	2. 0–6. 3	0. 08–0. 14	4. 5–5. 5	Low	(1)	(1).
95–100	85–95	80–95	65–90	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	High	High to moderate.
95–100	85–95	75–95	60–70	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Moderate	Moderate	High to moderate.
85–100	85–95	60–80	35–50	2. 0–6. 3	0. 12–0. 14	4. 5–5. 5	Low	(1)	(1).
95–100	85–95	75–95	65–85	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	High	High to moderate.
95–100	85–95	70–90	50–75	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Moderate	Moderate	High to moderate.
85–100	85–95	75–95	60–75	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Moderate	(1)	(1).
90–100	85–95	85–95	65–90	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	High	High to moderate.
90–100	85–95	75–95	55–75	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Moderate	Moderate	High to moderate.
100	100	85–100	60–90	0. 63–2. 0	0. 18–0. 24	5. 1–6. 0	Low	(1)	(1).
100	100	85–100	60–90	0. 63–2. 0	0. 18–0. 24	5. 1–6. 0	Low	High	Moderate.
100	100	50–75	15–30	6. 3–20. 0	0. 08–0. 10	5. 1–6. 0	Low	High	Moderate.
100	100	70–85	40–50	2. 0–6. 3	0. 12–0. 14	4. 5–5. 5	Low	(1)	(1).
100	100	85–95	50–75	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Moderate	High	High to moderate.
100	100	85–95	60–75	0. 06–0. 20	0. 06–0. 08	4. 5–5. 5	Low	High	High to moderate.
100	100	85–95	60–75	0. 63–2. 0	(3)	4. 5–5. 5	Low	High	High to moderate.
100	100	85–100	60–90	2. 0–6. 3	0. 18–0. 24	5. 1–6. 5	Low	(1)	(1).
100	100	85–100	60–90	0. 63–2. 0	0. 18–0. 24	5. 1–6. 5	Low	Low	Moderate to low.

TABLE 5.—*Estimated soil properties*

Soil series and map symbols	Depth to—		Depth from surface (typical profile)	Classification		
	Bedrock	Seasonal high water table		USDA texture	Unified	AASHO
	Feet	*Feet*	*Inches*			
Creedmoor: CsB2, CsC2	>5	2–3	0–7	Sandy loam	SM	A–2, A–4
			7–38	Heavy clay loam, clay	CH	A–7–5
			38–52	Clay loam	ML–CL	A–4, A–6
Cullen:						
CuB2, CuD2, CuE2	>5	>5	0–6	Loam	ML	A–4
			6–55	Clay, clay loam	MH	A–7
			55–72	Loam	ML	A–4
CvB3, CvD3	>5	>5	0–7	Clay loam	MH	A–7
			7–49	Clay, clay loam	MH	A–7
			49–66	Loam	ML	A–4
Enon:						
EnB2, EnC2	>3	>3	0–8	Fine sandy loam	SM	A–4
			8–30	Clay	CH	A–7
			30–42	Clay	CL, CH	A–6
EoC3	>3	>3	0–7	Clay loam	ML–CL	A–6
			7–26	Clay	CH	A–7
			26–38	Clay	CL, CH	A–6
Georgeville:						
GeB2, GeD2, GeE2	>10	>5	0–8	Silt loam	ML	A–4
			8–56	Silty clay loam, clay	MH	A–7–5
			56–80	Silty clay	MH	A–7–5
GgB3, GgD3	>10	>5	0–7	Silty clay loam	ML–CL	A–7
			7–49	Silty clay loam, clay	MH	A–7–5
			49–73	Silty clay	MH	A–7–5
Goldston: GoC, GoD, GoF	1½–3	>3	0–7	Silt loam	ML	A–4
			7–15	Slaty silt loam	ML, GM	A–4
			15–23	Very slaty silt loam	GM	A–2, A–4, A–1
Grover: GrB2, GrD2	3–10	>3	0–6	Sandy loam	SM	A–2, A–4
			6–28	Light clay loam, loam	MH	A–7
			28–52	Loam	ML	A–4
*Gullied land-Cecil complex: GuE. Properties of Gullied land are too variable to be rated. For Cecil part of GuE, see the Cecil series.						
Helena:						
HeB, HeC2	>4	2–3	0–7	Fine gravelly sandy loam	SM	A–2, A–4
			7–36	Sandy clay loam, clay	CH	A–7–5
			36–48	Clay loam	CL	A–6, A–7–6
HfB2, HfC2	>4	2–3	0–13	Fine sandy loam	SM	A–2, A–4
			13–37	Sandy clay, clay	CH	A–7–5
			37–52	Loam	CL	A–6, A–7–6
Herndon:						
HnB2, HnD2	>7	>5	0–11	Silt loam	ML	A–4
			11–44	Silty clay loam, clay	MH	A–7–5
			44–72	Silt loam	ML	A–7–5
HrB3, HrD3	>7	>5	0–7	Silty clay loam	ML–CL	A–7
			7–38	Silty clay loam, clay	MH	A–7–5
			38–66	Silt loam	ML	A–7–5
Iredell: IrB, IrB2, IrC2	>2	2–3	0–9	Loam	ML–CL	A–4
			9–37	Clay	CH	A–7–5
			37–48	Loam	ML–CL; ML	A–4

See footnotes at end of table.

significant to engineering—Continued

Percentage less than 3 inches passing sieve—				Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosion potential	
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)					Uncoated steel	Concrete
				Inches per hour	*Inches per inch of soil*	*pH*			
100	95–100	60–85	30–40	2. 0–6. 3	0. 10–0. 12	4. 5–5. 5	Low	(1)	(1).
100	100	90–100	75–85	< 0. 06	0. 14–0. 16	4. 5–5. 5	High	High	Moderate to high.
95–100	90–100	75–100	55–80	0. 20–0. 63	0. 14–0. 18	4. 5–5. 5	Moderate	High	Moderate to high.
85–100	85–100	80–95	60–75	2. 0–6. 3	0. 14–0. 18	5. 6–6. 0	Low	(1)	(1).
95–100	95–100	95–100	75–95	0. 63–2. 03	0. 14–0. 16	5. 6–6. 0	Moderate	High	Moderate.
95–100	95–100	80–95	60–75	2. 0–6.	0. 14–0. 18	5. 6–6. 5	Low	Moderate	Moderate to low.
85–100	85–100	85–100	65–75	0. 63–2. 0	0. 14–0. 18	5. 6–6. 0	Moderate	(1)	(1).
95–100	95–100	95–100	75–95	0. 63–2. 0	0. 14–0. 16	5. 6–6. 0	Moderate	High	Moderate.
95–100	95–100	80–95	60–75	2. 0–6. 3	0. 14–0. 18	5. 6–6. 5	Low	Moderate	Moderate to low.
85–100	85–100	70–85	40–50	2. 0–6. 3	0. 12–0. 14	6. 1–6. 6	Low	(1)	(1).
95–100	95–100	90–100	75–95	0. 06–0. 20	0. 14–0. 16	6. 1–6. 6	High	High	Low.
95–100	95–100	85–100	70–90	0. 06–0. 20	0. 14–0. 16	6. 1–7. 3	High	High	Low.
85–100	85–100	85–95	70–80	0. 63–0. 20	0. 14–0. 18	6. 1–6. 6	Moderate	(1)	(1).
95–100	95–100	90–100	75–95	0. 06–0. 20	0. 14–0. 16	6. 1–6. 6	High	High	Low.
95–100	95–100	90–100	70–80	0. 06–0. 20	0. 14–0. 16	6. 1–7. 3	Moderate	High	Low.
80–100	75–100	70–90	55–80	2. 0–6. 3	0. 18–0. 24	4. 5–5. 5	Low	(1)	(1).
95–100	95–100	90–100	80–95	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Moderate	High	Moderate to high.
95–100	95–100	90–100	80–98	0. 63–2. 0	0. 16–0. 22	4. 5–5. 5	Moderate	High	Moderate to high.
85–100	85–100	85–100	85–95	0. 63–2. 0	0. 16–0. 22	4. 5–5. 5	Moderate	(1)	(1).
95–100	95–100	95–100	80–95	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	High	Moderate to high.
95–100	95–100	95–100	90–95	0. 63–2. 0	0. 16–0. 22	4. 5–5. 5	Moderate	High	Moderate to high.
85–100	80–100	65–95	50–90	2. 0–6. 3	0. 14–0. 16	4. 5–5. 5	Low	(1)	(1).
50–65	50–65	45–65	40–60	2. 0–6. 3	0. 03–0. 05	4. 5–5. 5	Low	Low	Moderate to high.
20–50	20–50	20–50	15–45	6. 3–20. 0	0. 02–0. 04	4. 5–5. 5	Low	Low	Moderate to high.
85–100	85–95	50–70	25–40	2. 0–6. 3	0. 10–0. 12	4. 5–5. 5	Low	(1)	(1).
95–100	95–100	85–100	65–80	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Moderate	Moderate	Moderate to high.
95–100	85–95	70–90	50–75	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Low	Low	Moderate to high.
70–85	70–90	50–70	30–45	2. 0–6. 3	0. 08–0. 10	4. 5–5. 5	Low	(1)	(1).
95–100	85–95	75–90	65–85	0. 06–0. 20	0. 14–0. 16	4. 5–5. 5	High	High	Moderate to high.
95–100	85–95	75–90	60–75	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Moderate	Moderate	Moderate to high.
85–100	85–100	60–85	30–50	2. 0–6. 3	0. 12–0. 14	4. 5–5. 5	Low	(1)	(1).
95–100	85–100	80–97	65–90	0. 06–0. 20	0. 14–0. 16	4. 5–5. 5	High	High	Moderate to high.
95–100	85–100	70–90	50–75	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Low	Moderate	Moderate to high.
85–100	85–100	75–95	60–90	2. 0–6. 3	0. 14–0. 18	4. 5–5. 5	Low	(1)	(1).
95–100	95–100	85–100	75–96	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	High	Moderate to high.
95–100	95–100	85–100	65–95	0. 63–2. 0	0. 16–0. 22	4. 5–5. 5	Low	Moderate	Moderate to high.
85–100	85–100	75–95	70–90	0. 63–2. 0	0. 16–0. 22	4. 5–5. 5	Moderate	(1)	(1).
95–100	90–100	85–100	75–95	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	High	Moderate to high.
95–100	95–100	85–100	65–95	0. 63–2. 0	0. 16–0. 22	4. 5–5. 5	Low	Moderate	Moderate to high.
85–100	85–100	75–85	50–70	2. 0–6. 3	0. 12–0. 18	6. 1–6. 5	Low	(1)	(1).
95–100	95–100	90–100	80–95	0. 06–0. 20	0. 14–0. 16	6. 1–7. 3	High	High	Low.
95–100	80–100	75–100	60–88	0. 63–2. 0	0. 12–0. 18	6. 1–7. 3	Low	Moderate	Low.

TABLE 5.—*Estimated soil properties*

Soil series and map symbols	Depth to—		Depth from surface (typical profile)	Classification		
	Bedrock	Seasonal high water table		USDA texture	Unified	AASHO
	Feet	*Feet*	*Inches*			
*Louisa: LoD, LoF, LsE3	1–2	>2	0–9	Fine sandy loam	SM	A–2, A–4
			9–14	Fine gravelly loam	ML, SM	A–4
For Louisburg part of LsE3, see Louisburg series.			14–19	Gravelly loam	SM	A–4, A–2
Louisburg: LuC, LuD, LuF	2–4	2–4	0–19	Sandy loam	SM	A–2, A–4
			19–34	Gravelly sandy loam	SM	A–2
*Madison:						
MaB2, MaD2, MdE2	>4	>4	0–8	Fine sandy loam	SM	A–4
			8–37	Clay loam, sandy clay loam.	MH	A–7
For Grover part of MdE2, see Grover series.			37–52	Loam	ML	A–4
McB3, McD3	>4	>4	0–7	Clay loam	MH	A–7
			7–31	Clay loam, sandy clay loam.	MH	A–7
			31–46	Loam	ML	A–4
Masada: MeB2, MeD2, MeE	>4	>4	0–10	Fine sandy loam	SM	A–2, A–4
			10–55	Clay loam, clay	MH	A–7–5
			55–72	Clay loam	MH	A–7–5
Mayodan: MfB2, MfD2	>4	>4	0–11	Sandy loam, fine sandy loam.	SM	A–2, A–4
			11–44	Clay, clay loam	MH	A–7
			44–52	Loam	ML	A–4
Mecklenburg: MkB2, MkC2	>3	>3	0–8	Loam	ML	A–4
			8–36	Clay loam, clay	CH	A–7
			36–52	Clay loam	CL	A–6
Mecklenburg, loamy subsoil variant: MlB, MlC, MlE, MlE3.	>2	>2	0–8	Loam	ML	A–4
			8–25	Light clay loam	ML–CL	A–6
			25–36	Light clay loam	ML–CL	A–6
Orange: OrB, OrB2, OrC2	3½	1–2	0–14	Silt loam	ML	A–4
			14–37	Clay	CH	A–7–6
			37–60	Silt loam	CL	A–6
Pacolet:						
PaB2, PaD2, PaE2	>4	>4	0–7	Fine sandy loam	SM	A–4, A–2
			7–27	Clay	MH	A–7
			27–58	Clay loam	CL	A–6
PcC3, PcD3	>4	>4	0–7	Clay loam	MH	A–7
			7–21	Clay	MH	A–7
			21–52	Clay loam	CL	A–6
Pinkston: PkC, PkE	1½–3	>3	0–8	Fine sandy loam	SM	A–2, A–4
			8–19	Loam, silty clay loam	ML–CL	A–4, A–6
			19–26	Gravelly loam	CL	A–6
Roanoke: Ro	>10	0–1	0–6	Silt loam	ML	A–7–5
			6–59	Clay, silty clay loam	CH	A–7–6
			59–66	Loam	ML, CL	A–4, A–6
Starr: SrB	>10	>5	0–13	Loam	ML	A–4
			13–43	Silty clay loam	ML–CL	A–6
			43–60	Gravelly silt loam	ML, SM	A–4
State: StB	>6	>5	0–15	Silt loam	ML	A–4
			15–45	Heavy loam	CL	A–6
			45–50	Fine sandy loam	ML; ML–CL	A–4

See footnotes at end of table.

significant to engineering—Continued

Percentage less than 3 inches passing sieve—				Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosion potential	
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)					Uncoated steel	Concrete
				Inches per hour	*Inches per inch of soil*	*pH*			
85–95	80–95	55–80	30–50	2. 0–6. 3	0. 08–0. 14	4. 5–5. 5	Low	(1)	(1).
70–90	70–85	60–80	40–65	2. 0–6. 3	0. 08–0. 10	4. 5–5. 5	Low	Low	Moderate to high.
65–90	50–75	45–70	30–50	6. 3–20. 0	0. 08–0. 10	4. 5–5. 5	Low	Low	Moderate to high.
85–95	80–90	50–65	25–40	2. 0–6. 3	0. 08–0. 10	4. 5–5. 5	Low	(1)	(1).
75–95	70–85	40–60	20–35	6. 3–20. 0	0. 08–0. 10	4. 5–5. 5	Low	Low	Moderate to high.
90–95	85–95	70–85	40–50	2. 0–6. 3	0. 12–0. 14	4. 5–5. 5	Low	(1)	(1).
95–100	85–95	80–90	70–80	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Moderate	Moderate	Moderate to high.
95–100	85–95	75–85	60–75	2. 0–6. 3	0. 14–0. 16	4. 5–5. 5	Low	Moderate	Moderate to high.
90–100	85–95	70–85	60–70	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Moderate	(1)	(1).
95–100	85–95	80–90	70–80	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Moderate	Moderate	Moderate to high.
95–100	85–95	75–85	60–75	2. 0–6. 3	0. 14–0. 16	4. 5–5. 5	Moderate	Moderate	Moderate to high.
85–100	80–100	60–80	30–50	2. 0–6. 3	0. 12–0. 14	4. 5–5. 5	Low	(1)	(1).
85–100	85–100	75–95	65–85	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	High	Moderate to high.
80–100	80–100	70–95	55–80	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	Moderate	Moderate to high.
85–95	80–95	60–70	30–40	2. 0–6. 3	0. 10–0. 12	4. 5–5. 5	Low	(1)	(1).
95–100	90–100	85–100	75–95	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	High	Moderate to high.
80–100	80–100	80–90	50–70	2. 0–6. 3	0. 10–0. 12	4. 5–5. 5	Low	Moderate	Moderate to high.
85–100	85–95	70–85	50–70	2. 0–6. 3	0. 14–0. 18	6. 1–6. 5	Low	(1)	(1).
95–100	90–95	85–95	75–95	0. 06–0. 20	0. 14–0. 16	6. 1–6. 5	High	High	Low.
85–100	80–95	55–90	50–75	0. 63–2. 0	0. 10–0. 14	6. 5–7. 3	Moderate	Moderate	Low.
85–100	80–100	70–90	50–75	2. 0–6. 3	0. 14–0. 18	5. 5–6. 5	Low	(1)	(1).
85–100	85–90	70–85	60–80	0. 63–2. 0	0. 14–0. 18	5. 5–6. 5	Moderate	Moderate	Moderate to low.
75–95	65–90	60–90	50–75	0. 63–6. 3	0. 10–0. 14	6. 5–7. 3	Moderate	Moderate	Moderate to low.
85–100	80–100	75–100	60–90	2. 0–6. 3	0. 18–0. 24	5. 1–6. 0	Low	(1)	(1).
95–100	95–100	90–100	80–95	0. 06–0. 20	0. 14–0. 16	5. 1–6. 0	High	High	Moderate.
85–100	80–100	70–100	55–95	0. 63–2. 0	0. 14–0. 18	6. 0–6. 5	Low	Moderate	Moderate to low.
85–100	85–95	75–85	35–50	2. 0–6. 3	0. 12–0. 14	4. 5–5. 5	Low	(1)	(1).
95–100	90–95	75–90	65–85	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	High	Moderate to high.
75–100	70–90	70–90	55–70	0. 63–2. 0	0. 10–0. 14	4. 5–5. 5	Moderate	Moderate	Moderate to high.
85–100	85–95	60–80	55–80	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Moderate	(1)	(1).
95–100	90–95	75–90	65–85	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	High	Moderate to high.
75–100	70–90	70–90	55–70	0. 63–2. 0	0. 10–0. 14	4. 5–5. 5	Moderate	Moderate	Moderate to high.
80–100	80–95	60–80	30–50	2. 0–6. 3	0. 12–0. 14	4. 5–5. 5	Low	(1)	(1).
90–100	85–95	70–85	50–70	2. 0–6. 3	0. 14–0. 16	4. 5–5. 5	Low	Low	Moderate to high.
70–100	70–96	65–90	50–70	2. 0–6. 3	0. 14–0. 16	4. 5–5. 5	Low	Low	Moderate to high.
95–100	95–100	85–100	70–95	2. 0–6. 3	0. 18–0. 24	5. 1–5. 5	Low	(1)	(1).
95–100	95–100	90–100	75–95	0. 06–0. 20	0. 14–0. 16	5. 1–5. 5	High	High	Moderate.
85–100	80–100	65–96	50–75	2. 0–6. 3	0. 14–0. 16	5. 1–7. 3	Low	High	Moderate.
95–100	95–100	75–90	60–75	2. 0–6. 3	0. 14–0. 18	5. 5–6. 5	Low	(1)	(1).
95–100	95–100	85–95	80–90	2. 0–6. 3	0. 16–0. 22	5. 5–6. 5	Moderate	Moderate	Moderate to low.
75–100	65–100	65–100	45–80	2. 0–6. 3	0. 10–0. 14	5. 5–6. 5	Low	Low	Moderate to low.
100	100	95–100	70–90	2. 0–6. 3	0. 18–0. 24	4. 5–5. 5	Low	(1)	(1).
100	100	95–100	65–80	2. 0–6. 3	0. 14–0. 18	4. 5–5. 5	Low	Low	Moderate to high.
100	100	70–100	50–65	2. 0–6. 3	0. 10–0. 12	4. 5–5. 5	Low	Low	Moderate to high.

TABLE 5.—*Estimated soil properties*

Soil series and map symbols	Depth to—		Depth from surface (typical profile)	Classification		
	Bedrock	Seasonal high water table		USDA texture	Unified	AASHO
	Feet	*Feet*	*Inches*			
Toccoa: To	>10	>4	0–8	Fine sandy loam	SM	A–4
			8–52	Fine sandy loam	SM	A–4
Turbeville:						
TuB2, TuD2, TuF2	>5	>5	0–15	Fine sandy loam	SM	A–4, A–2
			15–72	Clay, sandy clay loam	MH	A–7–5
			72–84	Clay loam	CL	A–6
TvB3, TvD3	>7	>5	0–7	Clay loam	CL	A–6
			7–66	Clay, sandy clay loam	MH	A–7–5
			66–78	Clay loam	CL	A–6
Vance:						
VaB2, VaD2	>4	>4	0–6	Fine gravelly sandy loam	SM	A–2, A–4
			6–42	Clay, sandy clay	CH	A–7
			42–72	Fine gravelly clay loam	ML–CL	A–6
VcB2, VcC2, VcD2	>4	>4	0–7	Fine sandy loam	SM	A–4, A–2
			7–33	Clay, sandy clay	CH	A–7
			33–52	Clay	CH	A–7
Wedowee: WdB2, WdD2	>4	>4	0–7	Fine sandy loam	SM	A–4, A–2
			7–28	Clay, clay loam	MH	A–7
			28–48	Clay loam	CL	A–6
*Wehadkee:						
We	>5	0–1	0–18	Fine sandy loam	SM	A–4
			18–29	Silt loam	ML	A–4
			29–47	Silty clay loam	ML–CL	A–6
Wh, Wk	>5	0–1	0–29	Silt loam	ML	A–4
For Chewacla part of Wk, see Chewacla series.			29–60	Silty clay loam	ML–CL	A–6
Wickham: WlB, WlC2	>6	>5	0–13	Fine sandy loam	SM	A–4, A–2
			13–42	Sandy clay loam	SC	A–6
			42–62	Gravelly sandy loam	SM	A–2, A–4
Wilkes:						
WmB, WmD, WmF	>1½	>1½	0–7	Fine sandy loam	SM	A–2, A–4
			7–15	Clay, clay loam	CL	A–6
			15–24	Clay loam	CL	A–6
WnC3, WnF3	>1	>1	0–7	Clay loam	CL	A–6
			7–12	Clay, clay loam	CL	A–6
			12–21	Clay loam	CL	A–6
Worsham:						
Wo	>5	0–1	0–9	Silt loam	ML	A–4
			9–48	Clay, silty clay loam	CH	A–7
			48–60	Gravelly clay	CL	A–6
Wr	>5	0–1	0–12	Fine sandy loam	SM	A–4
			12–26	Clay	CH	A–7
			26–36	Clay loam fragipan	MH	A–7
			36–52	Fine sandy loam	SM	A–4

[1] Does not apply.
[2] Too variable for valid estimates.

significant to engineering—Continued

Percentage less than 3 inches passing sieve—				Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosion potential	
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)					Uncoated steel	Concrete
				Inches per hour	*Inches per inch of soil*	*pH*			
100	100	70–85	40–50	2. 0–6. 3	0. 12–0. 14	5. 6–6. 5	Low	(1)	(1).
100	100	70–85	40–50	2. 0–6. 3	0. 12–0. 14	5. 6–6. 5	Low	Low	Moderate to low.
90–100	90–100	60–90	35–50	2. 0–6. 3	0. 12–0. 14	4. 5–5. 5	Low	(1)	(1).
85–100	85–100	75–95	60–85	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	High	Moderate to high.
80–100	80–100	60–90	55–80	2. 0–6. 3	0. 10–0. 14	4. 5–5. 5	Moderate	Moderate	Moderate to high.
90–100	90–100	60–90	55–80	2. 0–6. 3	0. 10–0. 14	4. 5–5. 5	Moderate	(1)	(1).
85–100	85–100	75–95	60–85	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	High	Moderate to high.
80–100	80–100	60–90	55–80	2. 0–6. 3	0. 10–0. 14	4. 5–5. 5	Moderate	Moderate	Moderate to high.
75–90	70–85	50–70	30–40	2. 0–6. 3	0. 08–0. 10	4. 5–5. 5	Low	(1)	(1).
85–100	80–95	70–90	60–80	0. 06–0. 20	0. 14–0. 16	4. 5–5. 5	Moderately high.	High	Moderate to high.
65–95	65–95	60–80	50–70	0. 63–2. 0	0. 12–0. 16	4. 5–5. 5	Moderate	Moderate	Moderate to high.
85–95	80–95	60–80	35–50	2. 0–6. 3	0. 12–0. 14	4. 5–5. 5	Low	(1)	(1).
90–100	90–95	85–95	75–95	0. 06–0. 20	0. 14–0. 16	4. 5–5. 5	Moderately high.	High	Moderate to high.
80–100	80–100	75–95	70–90	0. 06–0. 20	0. 12–0. 14	4. 5–5. 5	Moderate	High	Moderate to high.
85–100	80–95	55–80	35–50	2. 0–6. 3	0. 12–0. 14	4. 5–5. 5	Low	(1)	(1).
95–100	85–95	80–95	60–85	0. 63–2. 0	0. 14–0. 16	4. 5–5. 5	Moderate	High	Moderate to high.
75–100	75–95	75–90	50–80	0. 63–2. 0	0. 10–0. 14	4. 5–5. 5	Moderate	Moderate	Moderate to high.
100	100	70–85	40–50	2. 0–6. 3	0. 12–0. 14	4. 5–5. 5	Low	(1)	(1).
100	100	90–100	70–90	0. 63–2. 0	0. 18–0. 24	4. 5–5. 5	Low	High	Moderate to high.
100	100	95–100	85–95	0. 63–2. 0	0. 16–0. 22	4. 5–5. 5	Moderate	High	Moderate to high.
100	100	90–100	70–90	2. 0–6. 3	0. 18–0. 24	4. 5–5. 5	Low	(1)	(1).
100	100	95–100	85–95	0. 63–2. 0	0. 16–0. 22	4. 5–5. 5	Moderate	High	Moderate to high.
80–100	85–100	65–80	35–50	2. 0–6. 3	0. 12–0. 14	5. 1–6. 5	Low	(1)	(1).
90–100	85–100	70–90	36–50	0. 63–2. 0	0. 14–0. 18	5. 1–6. 5	Moderate	Moderate	Moderate to low.
65–100	75–100	45–70	25–40	2. 0–6. 3	0. 08–0. 12	5. 1–6. 5	Low	Low	Moderate to low.
85–100	80–95	60–75	30–50	2. 0–6. 3	0. 12–0. 14	5. 6–6. 0	Low	(1)	(1).
85–100	80–95	75–95	60–80	0. 20–0. 63	0. 14–0. 16	5. 6–6. 0	Moderate	High	Moderate.
80–100	70–95	65–95	50–75	0. 63–2. 0	0. 08–0. 12	5. 6–7. 3	Moderate	Moderate	Moderate to low.
85–100	80–95	70–95	55–75	0. 63–2. 0	0. 12–0. 14	5. 6–6. 0	Moderate	(1)	(1).
80–100	85–95	75–95	60–80	0. 20–0. 63	0. 14–0. 16	5. 6–6. 0	Moderate	High	Moderate.
80–100	70–95	65–95	50–75	0. 63–2. 0	0. 08–0. 12	5. 6–7. 3	Moderate	Moderate	Moderate to low.
100	100	90–100	70–90	2. 0–6. 3	0. 18–0. 24	4. 5–5. 5	Low	(1)	(1).
100	100	95–100	85–95	0. 06–0. 63	0. 16–0. 22	4. 5–5. 5	Moderate to high.	High	Moderate to high.
70–100	70–100	70–100	70–90	0. 06–0. 63	0. 16–0. 22	4. 5–5. 5	Moderate to high.	High	Moderate to high.
100	100	70–85	40–50	2. 0–6. 3	0. 12–0. 14	4. 5–5. 5	Low	(1)	(1).
100	100	90–100	75–95	0. 06–0. 20	0. 14–0. 16	4. 5–5. 5	Moderate	High	Moderate to high.
100	100	85–95	60–75	< 0. 06	0. 06–0. 08	4. 5–5. 5	Low	High	Moderate to high.
100	100	70–85	40–50	2. 0–6. 3	(3)	4. 5–7. 3	Low	High	High to low.

[3] Water not available below fragipan.

TABLE 6.—*Interpretations of engineering*

[An asterisk in the first column indicates that at least one mapping unit in the series is made up of two or more kinds of soil and that another series in the first

Soil series and map symbols	Suitability as source of—		Soil features affecting—		
	Topsoil	Road fill	Highway location	Winter grading	Pipeline construction and maintenance
Abell: AbB	Fair: shallow to clay loam.	Fair to poor: moderate shrink-swell potential.	Occasional overflow.	Flooding	Occasional overflow.
Alluvial land: Ad	Fair: seasonal seepage.	Fair: seasonal seepage.	Seasonal seepage; flooding.	Seasonal wetness	Seepage; seasonal high water table.
Altavista: AfA, AfB, AfC2.	Fair: shallow to clay loam.	Fair: subsoil has moderate shrink-swell potential.	Seasonal high water table.	Seasonal wetness	Seasonal high water table.
Appling:					
ApC3, ApE3	Poor: shallow to clay.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope; clay loam surface layer.	Slope
AgB2, AgD2, AgE2	Poor: shallow to clay loam; some gravel present.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
AlB2, AlC, AlD2, AlE2, AmB2, AmD2.	Fair: shallow to clay loam.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
Augusta: AuA, AuB	Fair: shallow to clay loam.	Fair: subsoil has moderate shrink-swell potential.	Seasonal high water table; occasional flooding.	Seasonal wetness	Seasonal high water table.
*Buncombe: Bn, Bt. For the Toccoa part of Bt, see Toccoa series.	Poor: low available water capacity.	Good: sandy material	Frequent flooding	Frequent flooding	Frequent flooding
Cecil:					
CcB2, CcD2, CcE2	Poor: low available water capacity.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
CeB2, CeD2, CeE2, CfB2, CfD2, CfE2.	Fair: shallow to clay loam.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
ClB3, ClD3, ClE3, CmB3, CmD3.	Poor: shallow to clay.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
Chewacla: Cn	Fair: seasonal water table.	Fair: seasonal wetness	Flooding	Flooding	Flooding
Colfax: CoB	Fair: shallow to clay loam.	Fair: subsoil has moderate shrink-swell potential.	Seasonal high water table.	Seasonal high water table.	Seasonal high water table.
Congaree: Cr	Good	Good: low shrink-swell potential.	Flooding	Occasional flooding.	Occasional flooding.
Creedmore: CsB2, CsC2.	Fair: shallow to clay loam.	Poor: high shrink-swell potential.	Seasonal high water table.	Seasonal high water table; plastic clay.	Seasonal high water table; plastic clay.

properties of the soils

these soils may have different properties and limitations. For this reason the reader should carefully follow the instructions for referring to column of this table]

Soil features affecting—Continued					
Farm ponds		Agricultural drainage	Irrigation	Terraces or diversions	Grassed waterways
Reservoir area	Dikes, levees, and embankments				
Pervious material	Fair to good stability; fair to good compaction.	Seasonal high water table.	Overflow from adjacent slopes.	Siltation; seasonally wet.	Siltation; seasonally wet.
Pervious material	Poor to good stability.	Seasonal seepage	Seasonal seepage	Seasonal seepage	Siltation; seasonal seepage.
Pervious substratum	Fair to good stability and compaction.	Occasional flooding	Occasional flooding	Short slopes	Moderately well drained.
Moderate permeability; slope.	Poor compaction; poor stability.	Well drained	Slope; slow intake rate.	Slope; low fertility.	Slope; low fertility.
Moderate permeability; slope.	Poor compaction; poor stability.	Well drained	Slope	Slope; low fertility.	Slope; low fertility.
Moderate permeability; slope.	Poor compaction; poor stability.	Well drained	Slope	Slope; low fertility.	Slope; low fertility.
Pervious substratum	Poor to good stability and compaction.	Occasional flooding	Occasional flooding	Short slopes; slow permeability.	Somewhat poorly drained.
Frequent flooding	Poor resistance to piping; pervious material.	Frequent flooding	Frequent flooding	Frequent flooding	Frequent flooding.
Well drained; moderate permeability.	Poor compaction	Well drained	Slope; low fertility	Slope	Slope.
Well drained; moderate permeability.	Poor compaction	Well drained	Slope	Slope	Slope.
Well drained; moderate permeability.	Poor compaction	Well drained	Slope; low fertility	Slope; clay loam surface layer.	Slope.
Pervious substrata; flooding.	Fair compaction; subject to piping.	Flooding; somewhat poorly drained.	Flooding	Flooding; nearly level.	Flooding; nearly level.
Fragipan; seasonal high water table.	Fair to poor compaction.	Slow permeability; fragipan.	Slow permeability; fragipan.	Seasonal wetness	Fragipan; seasonal high water table.
Occasional flooding	Fair to poor compaction.	Occasional flooding	Occasional flooding	Occasional flooding	Occasional flooding.
Very slow permeability.	Poor compaction	Very slow permeability.	Very slow permeability; low fertility.	Seasonal wetness; plastic clay.	Seasonal high water table; plastic clay.

TABLE 6.—*Interpretations of engineering*

Soil series and map symbols	Suitability as source of—		Soil features affecting—		
	Topsoil	Road fill	Highway location	Winter grading	Pipeline construction and maintenance
Cullen:					
CuB2, CuD2, CuE2	Fair: shallow to clay loam.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
CvB3, CvD3	Poor: shallow to clay.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope; clay loam surface.	Slope
Enon:					
EnB2, EnC2	Fair: shallow to clay loam.	Poor: high shrink-swell potential; plastic clay.	High shrink-swell potential.	Plastic clay	Plastic clay
EoC3	Poor: shallow to clay.	Poor: high shrink-swell potential.	High shrink-swell potential.	Plastic clay	Plastic clay
Georgeville:					
GeB2, GeD2, GeE2	Fair: shallow to silty clay loam.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
GgB3, GgD3	Poor: shallow to clay.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
Goldstone: GoC, GoD, GoF.	Poor: bedrock at depth of 20 to 36 inches.	Poor: bedrock at depth of 20 to 36 inches.	Bedrock at depth of 20 to 36 inches.	Slope	Bedrock at depth of 20 to 36 inches.
Grover: GrB2, GrD2	Fair: shallow to clay loam.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
*Gullied land-Cecil complex: GuE. Interpretations are for Gullied land only. For Cecil part of GuE, see the Cecil series.	Poor: shallow to clay.	Fair: subsoil has moderate shrink-swell potential.	Some steep areas	Slope; shallow to clay.	Deep gullies; siltation.
Helena:					
HeB, HeC2	Poor: low available water capacity.	Poor: high shrink-swell potential; plastic clay.	Seasonal high water table; plastic clay.	Plastic clay	Plastic clay; seasonal high water table.
HfB2, HfC2	Fair: shallow to clay loam.	Poor: high shrink-swell potential; plastic clay.	Seasonal high water table; plastic clay.	Plastic clay	Plastic clay; seasonal high water table.
Herndon:					
HnB2, HnD2	Fair: shallow to silty clay loam.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
HrB3, HrD3	Poor: shallow to clay.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
Iredell: IrB, IrB2, IrC2.	Poor: shallow to clay.	Poor: high shrink-swell potential; plastic clay.	High shrink-swell potential.	Plastic clay	Depth to bedrock is 24 to 60 inches.
*Louisa: LoD, LoF, LsE3. For Louisburg part of LsE3, see the Louisburg series.	Poor: bedrock at depth of 15 to 20 inches.	Poor: bedrock at depth of 15 to 20 inches.	Bedrock at depth of 15 to 20 inches.	Slope	Depth to bedrock is 15 to 20 inches.
Louisburg: LuC, LuD, LuF.	Fair: bedrock at depth of 24 to 48 inches.	Fair: bedrock at depth of 24 to 48 inches.	Bedrock at depth of 24 to 48 inches.	Slope	Depth to bedrock is 24 to 48 inches.

properties of the soils—Continued

Soil features affecting—Continued					
Farm ponds		Agricultural drainage	Irrigation	Terraces or diversions	Grassed waterways
Reservoir area	Dikes, levees, and embankments				
Well drained; moderate permeability.	Poor compaction	Well drained	Slope	Slope	Features mostly favorable.
Well drained; moderate permeability.	Poor compaction	Well drained	Slope; slow intake rate.	Slope; clay loam surface.	Features mostly favorable.
Slow permeability	Poor compaction; high shrink-swell potential.	Dense subsoil; slow permeability.	Dense subsoil; slow intake rate.	Dense subsoil	Dense subsoil.
Slow permeability	Poor compaction; high shrink-swell potential.	Dense subsoil; slow permeability.	Dense subsoil; slow intake rate.	Dense subsoil	Dense subsoil.
Moderate permeability.	Poor compaction	Well drained	Slope	Slope	Features mostly favorable.
Moderate permeability.	Poor compaction	Well drained	Slope; slow intake rate.	Slope	Features mostly favorable.
Bedrock at depth of 20 to 36 inches.	Fair to poor compaction; limited material available.	Bedrock at depth of 20 to 36 inches.	Bedrock at depth of 20 to 36 inches.	Slope; limited depth to bedrock.	Bedrock at depth of 20 to 36 inches.
Moderate permeability.	Fair to good stability.	Well drained	Slope; low fertility	Slope	Features mostly favorable.
Moderate permeability.	Poor compaction	Well drained	Erosion; siltation; deep gullies.	Clayey surface layer; slope.	Some deep gullies.
Slow permeability	Poor compaction	Slow permeability	Moderately well drained; low fertility.	Seasonal wetness	Seasonal high water table.
Slow permeability	Poor compaction	Slow permeability	Moderately well drained; low fertility.	Seasonal wetness	Seasonal high water table.
Moderate permeability.	Poor compaction	Well drained	Slope	Slope	Features mostly favorable.
Moderate permeability.	Poor compaction	Well drained	Slope; slow intake rate.	Slope	Features mostly favorable.
Depth to bedrock is 24 to 60 inches.	Poor compaction	Slow permeability	Dense subsoil; slow intake rate.	Dense subsoil	Dense subsoil.
Somewhat excessively drained; shallow to rock.	Limited material	Well drained	Depth to bedrock is 15 to 20 inches.	Slope; stones	Bedrock at depth of 15 to 20 inches.
Well drained to excessively drained.	Fair to good compaction.	Well drained	Depth to bedrock is 24 to 48 inches; slope.	Slope; stones	Bedrock at depth of 24 to 48 inches.

TABLE 6.—*Interpretations of engineering*

Soil series and map symbols	Suitability as source of—		Soil features affecting—		
	Topsoil	Road fill	Highway location	Winter grading	Pipeline construction and maintenance
*Madison: MaB2, MaD2, MdE2. For Grover part of MdE2, see Grover series.	Fair: shallow to clay loam.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
McB3, McD3	Poor: shallow to clay.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
Masada: MeB2, MeD2, MeE.	Fair: shallow to clay loam.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
Mayodan: MfB2, MfD2.	Fair: shallow to clay loam.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope; plastic clay.	Slope; plastic
Mecklenburg: MkB2, MkC2.	Poor: shallow to clay.	Poor: high shrink-swell potential; plastic clay.	High shrink-swell potential.	Plastic clay	Plastic clay
Mecklenburg, loamy subsoil variant: MlB, MlC, MlE, MlE3.	Fair: shallow to clay loam.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Depth to bedrock is 24 to 60 inches.
Orange: OrB, OrB2, OrC2.	Poor: shallow to clay.	Poor: high shrink-swell potential; plastic clay.	Seasonal high water table; plastic clay.	Plastic clay; seasonally wet.	Seasonal high water table; plastic clay.
Pacolet: PaB2, PaD2, PaE2	Fair: shallow to clay loam.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
PcC3, PcD3	Poor: shallow to clay.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
Pinkston: PkC, PkE	Fair: bedrock at depth of 20 to 36 inches.	Poor: bedrock at depth of 20 to 36 inches.	Bedrock at depth of 20 to 36 inches.	Slope	Depth to bedrock is 20 to 36 inches.
Roanoke: Ro	Poor: seasonal wetness.	Poor: high shrink-swell potential.	Seasonal high water table.	Seasonally wet	Seasonal high water table.
Starr: SrB	Fair: shallow to clay loam.	Fair: subsoil has moderate shrink-swell potial.	Occasional surface flooding.	Features generally favorable.	No unfavorable features.
State: StB	Good	Fair to good: low shrink-swell potential.	Occasional flooding.	Features mostly favorable.	Occasional flooding.
Toccoa: To	Good	Good	Frequent flooding	Features mostly favorable.	Frequent flooding.
Turbeville: TuB2, TuD2, TuF2	Fair: shallow to clay loam.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope; plastic clay.	Plastic clay
TvB3, TvD3	Poor: shallow to clay.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope; plastic clay.	Plastic clay

properties of the soils—Continued

Soil features affecting—Continued					
Farm ponds		Agricultural drainage	Irrigation	Terraces or diversions	Grassed waterways
Reservoir area	Dikes, levees, and embankments				
Moderate permeability.	Fair to poor compaction.	Well drained	Slope; low fertility	Slope	Features mostly favorable.
Moderate permeability.	Fair to poor compaction.	Well drained	Slope; low fertility	Slope; clay loam surface layer.	Features mostly favorable.
Moderate permeability.	Poor compaction	Well drained	Slope; low fertility	Slope	Features mostly favorable.
Moderate permeability.	Poor compaction	Well drained	Slope; low fertility	Slope; plastic clay	Features mostly favorable.
Slow permeability	Poor compaction; high shrink-swell potential.	Dense subsoil; slow permeability.	Dense subsoil; slow intake rate.	Dense subsoil	Dense subsoil.
Depth to bedrock is is 24 to 60 inches.	Fair compaction	Depth to bedrock is 24 to 60 inches.	Slope	Slope; stones	Bedrock at depth of 24 to 60 inches.
Slow permeability	Poor compaction; plastic clay.	Slow permeability; dense subsoil.	Dense subsoil; slow permeability.	Seasonal wetness; dense subsoil.	Seasonal high water table.
Moderate permeability.	Fair to poor compaction.	Well drained	Slope; low fertility	Slope	Features mostly favorable.
Moderate permeability.	Fair to poor compaction.	Well drained	Slope; low fertility	Slope; clay loam surface layer.	Features mostly favorable.
Moderately rapid permeability.	Fair to poor compaction.	Depth to bedrock is 20 to 36 inches.	Slope; depth to bedrock is 20 to 36 inches.	Slope; stones	Bedrock is at depth of 20 to 36 inches.
Slow permeability	Poor compaction	Slow permeability	Poorly drained	Seasonal wetness	Seasonal high water table.
Pervious material	Fair to good compaction.	Well drained	Features mostly favorable.	Features mostly favorable.	Features mostly favorable.
Pervious material	Fair to good compaction.	Well drained	Occasional flooding	Occasional flooding	Occasional flooding.
Pervious material	Fair to good compaction.	Well drained	Frequent flooding	Frequent flooding; nearly level.	Frequent flooding; nearly level.
Possible high seepage in substratum.	Poor compaction	Well drained	Slope; low fertility	Slope	Features mostly favorable.
Possible high seepage in substratum.	Poor compaction	Well drained	Slope; low fertility	Slope; clay loam surface layer.	Features mostly favorable.

TABLE 6.—*Interpretations of engineering*

Soil series and map symbols	Suitability as source of—		Soil features affecting—		
	Topsoil	Road fill	Highway location	Winter grading	Pipeline construction and maintenance
Vance:					
VaB2, VaD2	Poor: low available water capacity.	Poor: moderately high shrink-swell potential.	Moderately high shrink-swell potential.	Slope	Features mostly favorable.
VcB2, VcC2, VcD2	Fair: shallow to clay loam.	Poor: moderately high shrink-swell potential.	Moderately high shrink-swell potential.	Slope	Features mostly favorable.
Wedowee: WdB2, WdD2.	Fair: shallow to clay loam.	Fair: subsoil has moderate shrink-swell potential.	Some hilly areas	Slope	Slope
*Wehadkee: We, Wh, Wk. For Chewacla part of Wk, see Chewacla series.	Fair: seasonal wetness.	Fair: subsoil has moderate shrink-swell potential.	Frequent flooding	Seasonally wet	Frequent flooding
Wickham: WlB, WlC2	Fair: shallow to clay loam.	Fair: subsoil has moderate shrink-swell potential.	Features mostly favorable.	Features mostly favorable.	Features mostly favorable.
Wilkes:					
WmB, WmD, WmF	Fair: bedrock at depth of 20 to 48 inches.	Poor: bedrock at depth of 20 to 48 inches.	Bedrock at depth of 20 to 48 inches; some steep slopes.	Slope	Depth to bedrock is 20 to 48 inches.
WnC3, WnF3	Poor: bedrock at depth of 14 to 42 inches.	Poor: bedrock at depth of 14 to 42 inches.	Bedrock at depth of 14 to 42 inches; some steep slopes.	Slope	Depth to bedrock is 14 to 42 inches.
Worsham: Wo	Fair: seasonal wetness.	Fair: moderate to high shrink-swell potential.	Seasonal high water table.	Seasonally wet	Seasonal high water table.
Worsham, fragipan variant: Wr.	Fair: seasonal wetness.	Fair: moderate shrink-swell potential.	Seasonal high water table.	Seasonally wet	Seasonal high water table.

properties of the soils—Continued

Soil features affecting—Continued					
Farm ponds		Agricultural drainage	Irrigation	Terraces or diversions	Grassed waterways
Reservoir area	Dikes, levees, and embankments				
Slow permeability	Poor compaction	Well drained	Slow permeability; low fertility.	Clayey subsoil	Features mostly favorable.
Slow permeability	Poor compaction	Well drained	Slow permeability; low fertility.	Clayey subsoil	Features mostly favorable.
Moderate permeability.	Fair to poor compaction.	Well drained	Slope; low fertility	Slope	Features mostly favorable.
Frequent flooding	Fair to poor compaction.	Frequent flooding; poorly drained.	Frequent flooding	Frequent flooding	Frequent flooding.
Well drained	Fair to good compaction.	Well drained	Features mostly favorable.	Features mostly favorable.	Features mostly favorable.
Moderate permeability; limited depth.	Fair to good compaction.	Well drained	Depth to bedrock is 20 to 48 inches; slope.	Slope; stones	Bedrock is at a depth of 20 to 48 inches.
Moderate permeability; limited depth.	Fair to good compaction.	Well drained	Depth to bedrock is 14 to 42 inches; slope.	Slope; stones	Bedrock is at depth of 14 to 42 inches.
Seasonal high water table.	Fair to poor compaction.	Seasonal high water table; poorly drained.	Poorly drained	Seasonal wetness	Seasonal high water table.
Seasonal high water table.	Fair to poor compaction.	Seasonal high water table; poorly drained.	Poorly drained	Seasonal wetness	Seasonal high water table.

TABLE 7.—*Engineering*

[Tests were performed by the Virginia Department of Highways, Materials Division, in accordance

Soil name and location of sample site	Sample No.	Depth	Moisture density [1]		Liquid limit	Plasticity index	Mechanical analysis [2]	
			Maximum dry density	Optimum moisture			Percentage passing sieve [3]—	
							1½-in.	¾-in.
		In.	*Lb. per cu. ft.*	*Pct.*				
Creedmoor sandy loam:								
1 mile south of Charlotte Court House and 200 feet east of State Highway No. 47 (modal profile).	50–50969	0–7	119	10	18	[5] NP	100	100
	50–50970	22–33	94	22	80	49	100	100
	50–50971	38–52	124	11	28	8	97	96
Georgeville silt loam:								
0.5 mile southeast of U.S. Highway No. 360 and No. 15 and 100 yards northeast of State Highway No. 646, in forest (modal profile).	50–50980	1½–8	114	13	23	NP	100	89
	50–50981	17–37	91	29	68	28	100	100
	50–50982	56–80	96	27	63	24	100	100
Helena fine sandy loam:								
At Prince Edward County line, on State Highway 671, 2 miles southeast of junction of State Highway No. 671 and No. 654, on west side of road (modal profile).	50–50983	3–9	116	12	18	NP	100	100
	50–50984	19–31	96	25	67	35	100	99
	50–50985	37–52	109	14	43	20	100	99
Herndon silt loam:								
0.5 mile southeast of U.S. Highway No. 360 and No. 15 on State Highway No. 646 and 0.5 mile northeast on logging trail in forest (modal profile).	50–50958	1–8	110	14	20	NP	100	100
	50–50959	14–33	93	30	82	42	100	100
	50–50960	44–54	91	26	43	11	100	100
Iredell loam:								
On U.S. Highway No. 15 near Mecklenburg County line at St. Ledel Church and 100 feet east of road (modal profile).	50–50986	0–6	120	13	24	5	100	100
	50–50987	14–33	92	29	96	65	100	98
	50–50988	37–48	107	18	36	7	100	100
Masada fine sandy loam:								
On Roanoke Plantation, 0.25 mile south of main house and 200 feet west of lane (modal profile).	50–50966	2–10	125	9	16	NP	100	98
	50–50967	25–39	91	28	69	26	100	100
	50–50968	50–55	95	26	71	31	100	100
Orange silt loam:								
200 feet northwest of U.S. Highway No. 360 and No. 15 on State Highway No. 626, east of road, in pine planting (modal profile).	50–50974	0–9	114	12	18	NP	100	100
	50–50975	21–30	103	21	64	45	100	100
	50–50976	37–48	113	12	38	21	100	100
Pinkston fine sandy loam:								
Near U.S. Highway No. 40 and Roanoke Creek Bridge, 100 yards northeast of bridge, in forest (modal profile).	50–50972	2–8	112	12	22	1	100	100
	50–50973	19–26	118	13	32	11	100	100
Roanoke silt loam:								
2 miles southeast of Randolph at Moratock Plantation, on river terrace, 0.5 mile south of main house (modal profile).	50–50961	0–6	91	26	48	14	100	100
	50–50962	31–51	102	20	55	32	100	100
	50–50963	59–66	110	16	30	13	100	100
State silt loam:								
200 feet south of State Highway No. 607 and 1 mile east of Roanoke River Bridge (modal profile).	50–50955	0–10	105	18	32	5	100	100
	50–50956	15–35	112	16	31	11	100	100
	50–50957	50–60	113	16	30	9	100	100
Turbeville fine sandy loam:								
On Roanoke Plantation, near Randolph, 100 yards west of main house, in timber, 100 feet south of lane (modal profile).	50–50964	2–11	123	9	18	NP	100	100
	50–50965	31–72	97	24	50	18	100	100

[1] Based on AASHO Designation T 99–57, Method A (*2*).

[2] Mechanical analyses according to AASHO Designation T 88–57 (*2*). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soils.

test data

with standard test procedures of the American Association of State Highway Officials (AASHO) (*2*)]

Mechanical analysis [2]—Continued									Classification	
Percentage passing sieve [3]—Continued				Percentage smaller than—					AASHO	Unified [4]
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.	0.001 mm.		
100	99	84	39	22	13	5	2	--------	A-4(1)	SM
100	100	94	79	70	64	55	54	48	A-7-5(20)	CH
95	93	75	59	25	16	14	6	4	A-4(5)	ML-CL
81	77	70	58	39	22	10	5	3	A-4(5)	ML
100	100	99	95	86	78	70	64	61	A-7-5(20)	MH
100	100	100	98	83	76	51	43	39	A-7-5(18)	MH
100	99	85	49	34	32	9	4	2	A-4(3)	SM
99	99	97	87	78	64	49	41	38	A-7-5(20)	CH
98	98	84	64	49	39	25	20	17	A-7-6(11)	CL
97	96	93	82	57	30	11	6	3	A-4(8)	ML
100	100	99	96	90	77	63	54	50	A-7-5(20)	MH
100	100	99	92	77	57	26	18	16	A-7-5(9)	ML
99	98	79	59	41	24	7	3	1	A-4(5)	ML-CL
98	98	96	93	80	73	65	60	56	A-7-5(20)	CH
100	100	97	88	44	22	5	2	2	A-4(8)	ML
85	81	66	32	22	16	9	4	2	A-2-4(0)	SM
100	100	92	79	73	68	60	55	51	A-7-5(19)	MH
100	100	92	78	71	63	52	44	40	A-7-5(20)	MH
100	100	96	84	58	38	12	7	4	A-4(8)	ML
100	100	99	94	86	59	58	51	48	A-7-6(20)	CH
100	100	99	93	74	48	30	26	22	A-6(13)	CL
97	93	71	42	30	21	11	7	2	A-4(2)	SM
99	96	81	56	39	29	18	13	12	A-6(5)	CL
100	100	98	91	73	49	22	11	6	A-7-5(12)	ML
100	100	99	90	83	72	59	50	45	A-7-6(19)	CH
98	98	96	75	55	42	20	12	9	A-6(10)	CL
100	100	99	86	67	43	17	8	4	A-4(8)	ML
100	100	99	73	56	45	33	26	21	A-6(9)	CL
100	100	99	60	45	35	27	21	17	A-4(5)	ML-CL
100	100	86	37	24	16	7	3	2	A-4(1)	SM
100	100	94	73	66	63	62	58	58	A-7-5(13)	MH

[3] 100 percent of all samples passed through a 3-inch sieve.

[4] SCS and Bureau of Public Roads (BPR) have agreed to consider that all soils having plasticity indexes within 2 points of A-line are to be given a borderline classification. Example of borderline classification obtained by this use is ML-CL.

[5] Nonplastic.

It should be emphasized that the interpretations made in this soil survey do not eliminate the need for onsite sampling and testing of soils for specific engineering works.

Some of the terms used by the soil scientist may be unfamiliar to the engineer and some words—for example, soil, clay, silt, and sand—may have special meaning in soil science. These and other special terms used in the soil survey are defined in the Glossary at the back of this survey.

Engineering classification systems

The two systems most commonly used in classifying samples of soils for engineering are the Unified system (*10*) used by the SCS engineers, Department of Defense, and other organizations, and the AASHO system (*2*) adopted by the American Association of State Highway Officials.

In the Unified system soils are classified according to particle-size distribution, plasticity, liquid limit, and organic matter. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes are designated by symbols for both classes; for example, ML–CL.

The AASHO system is used to classify soils according to those properties that affect use in highway construction and maintenance. In this system, a soil is placed in one of seven basic groups ranging from A–1 through A–7 on the basis of grain-size distribution, liquid limit, and plasticity index. In group A–1 are gravelly soils of high bearing strength, or the best soils for subgrade (foundation). At the other extreme, in group A–7, are clay soils that have low strength when wet and that are the poorest soils for subgrade. Where laboratory data are available to justify a further breakdown, the A–1, A–2, and A–7 groups are divided as follows: A–1–a, A–1–b, A–2–4, A–2–5, A–2–6, A–2–7, A–7–5, and A–7–6. As additional refinement, the engineering value of a soil material can be indicated by a group index number. Group indexes range from 0 for the best material to 20 or more for the poorest. The AASHO classification for tested soils, with group index numbers in parentheses, is shown in table 7; the estimated classification, without group index numbers, is given in table 5 for all soils mapped in the survey area.

Estimated engineering properties

Table 5 provides estimates of soil properties that are important in engineering, and it gives estimated AASHO and Unified classifications for the soils. The textural terms used to describe the soil material in the main horizons are those used by the U.S. Department of Agriculture (*8*). The estimates in table 5 are based on the results of tests shown in table 7, on information in other parts of this survey, and on general knowledge of these soils within the county and in other counties.

In table 5 depth to a seasonal high water table refers to the shallowest depth to which the water table rises in winter and early in spring. This water table may be a perched one or an ordinary ground-water table.

The percentage passing the various sieves depends on the particle size. Sand, except for a part of very fine sand, and other coarser materials do not pass through the No. 200 sieve, but silt and clay particles do. Silt is the material between 0.002 and 0.074 millimeter in diameter. Clay is that material smaller than 0.002 millimeter in diameter.

Permeability, as used in table 5, relates only to movement of water downward through an undisturbed and uncompacted soil. It does not include lateral seepage. The estimates are based on structure and porosity of the soil. The effect of plowplans, surface crusts, and other properties resulting from use of the soils is not considered. Terms used to describe permeability, expressed in inches per hour, are given in the Glossary at the back of this survey.

Available water capacity (also termed available moisture capacity), estimated in inches per inch of soil depth, is the capacity of soils to hold water available for use by most plants. It is commonly defined as the differences between the amount of soil water at field capacity and the amount at wilting point.

Reaction is the degree of acidity or alkalinity of a soil, expressed as a pH value. The pH values and relative terms used to describe soil reaction are defined in the Glossary.

Shrink-swell potential is an indication of the volume change to be expected of soil material with changes in moisture content. The shrinking and swelling of soils cause much damage to the foundations of buildings, to roads, and to other structures. If soil material has a high shrink-swell potential, it is normally undesirable for engineering purposes.

Corrosion potential, as used in table 5, refers to the hazard of deterioration of uncoated metal or concrete in structures as the result of chemical and electrolytic action. The potential of corrosion varies, depending upon the kind of soil. Pipes that are in more than one kind of soil or that pass through more than one soil horizon are more likely to be damaged by corrosion than pipes that are buried entirely in one kind of soil or that are in only one soil horizon.

Engineering interpretations

In table 6 the soils of the county are rated according to their suitability as a source of topsoil and road fill. In addition, this table gives soil features that affect suitability of the soils for location of highways and for engineering structures and practices. The suitability ratings and soil features given are based on known data and on estimates of physical properties of the soils.

None of the soils in Charlotte County is a source of sand and gravel.

In estimating the ratings of soils for suitability as a source of topsoil, only the uppermost 10 to 15 inches of soil material was ordinarily considered.

Suitability as a source of road fill depends largely upon the texture of the soil, on the natural content of water, and on the behavior of the soil when compacted and used as a subbase for a highway.

Soil features that affect location of highways include depth to rock, stones on or in the soil, drainage, shrink-swell potential, slope, and susceptibility of the soils to frost heaving. Organic soils are not suitable for highways.

The ratings given in the column headed "Soil features affecting winter grading" are based largely on soil tex-

ture, natural content of water, and depth to the water table in winter. Clayey soils are difficult to work when wet and must be dried to the proper moisture content for compaction.

Construction and maintenance of pipelines are affected by depth to bedrock, stones on or in the soil, rock outcrops, a seasonal high water table, a hazard of flooding, and slope.

Soil features that affect use of a soil for the reservoir area where water is impounded are those of a soil that has not been disturbed. Features that affect use of a soil for pond embankments relate to a soil that has been moved from its natural position to a place in the embankment of the pond.

Agricultural drainage depends upon those features and qualities of the soil that affect the installation of a drainage system and the performance of surface or subsurface drains. These are slope, height of the water table, permeability, depth to rock, and availability of suitable outlets.

The rate of water intake, permeability, natural drainage, and the available moisture capacity are properties of soils that affect irrigation. A high water table, susceptibility to flooding, slopes, the presence of coarse fragments, and depth to rock are also important.

Terraces and diversions are affected by slope, soil stability, and soil depth. Also important are the ease with which the channel can be protected from siltation and a cover of plants established and maintained.

Soil features that affect establishment and maintenance of grassed waterways are similar to those that affect terraces and diversions. Features that affect the establishment and maintenance of a cover of grass are especially important.

Soil test data

Table 7 gives the results of laboratory tests of samples of soils from 11 series in Charlotte County. The tests were performed by the Virginia Department of Highways under a cooperative agreement with the U.S. Department of Commerce, Bureau of Public Roads. They were done in accordance with standard test procedures of the American Association of State Highway Officials to help evaluate the soils for engineering purposes.

The engineering soil classifications given in table 7 are based on data obtained by mechanical analyses and by tests to determine liquid limits and plastic limits. Mechanical analyses were made by the combined sieve and hydrometer methods. The percentage of clay obtained by the hydrometer method should not be used in naming textural classes of soils.

Use of the Soils for Community Development and Recreation

Table 8 shows the estimated degree and kinds of limitations of each soil in Charlotte County for low buildings; septic tank disposal fields; sewage lagoons; local roads and streets; lawns, landscaping, and golf fairways; and camping and picnic areas. The degree of limitation is indicated by the words *slight*, *moderate*, and *severe*. A limitation of *slight* indicates that the soil has no important limitation for the specified use. A rating of *moderate* or *severe* means that the site should be inspected to determine its suitability for a particular use.

The ratings in table 8 represent typical conditions for each kind of soil shown on the detailed soil map. The limitation at a particular site or on a particular lot may vary in degree and kind from that listed in table 8 because of the natural variation within any one soil area. A supplementary onsite investigation should be made before using the soils for the purposes listed in table 8, especially where considerable cost is involved.

The column headed "Buildings of 3 stories or less" refers only to the location of buildings that have a basement and that are not more than three stories high. These buildings include dwellings and buildings used by light industrial or commercial establishments and by institutions.

The degree of limitation for use as a septic tank disposal field is based on depth to bedrock, slope and permeability of the soil, the hazard of flooding, and the presence or absence of a seasonal high water table. All sites should be inspected before they are used as a disposal field for a septic tank.

The limitations for sewage lagoons are based on slope, permeability, and content of organic matter of the soil at the site; depth to bedrock; size and amount of coarse fragments; texture of the material that will be used in embankments at the site; and the hazard of flooding.

The limitations for local roads and streets apply only to hard-surfaced roads similar to those in residential areas or towns. They do not apply to freeways and interstate highways intended for intensive use.

Soil material suitable for growing grass, shrubs, and trees is necessary for lawns, landscaping, and golf fairways. In most areas developed for homes and golf courses, the natural surface soil, or topsoil, can be used for lawns, flowers, shrubs, and trees and should be saved. It can be removed from the site, stored until construction and grading are completed, and then returned. Among the soil properties that determine whether a good lawn or golf fairway can be established are natural drainage, degree of slope, depth to bedrock or other restrictive layer, texture of the surface soil, stoniness, outcrops of rock, and the hazard of flooding.

Camping areas should be located in an area where the landscape is attractive, the trafficability is good, and the soils are moderately well suited or well suited to grass and trees. Soils that are naturally well drained or moderately well drained have less serious limitations than wetter soils. Limitations for campsites are moderate on somewhat poorly drained soils and are severe on poorly drained and very poorly drained soils. In addition, limitations are severe on soils along streams where flooding is a hazard, and where areas are ponded after heavy rains. As a rule, slopes of more than 15 percent have severe limitations for use as a campsite for tents, and small camp trailers.

Picnic grounds are not used intensively but are used largely by persons walking alone or in small groups. The problems of supplying water and disposing of sewage were not considered. The requirements are the same as for camping areas but are less exacting.

TABLE 8.—*Estimated degree and kinds of limitations*

[An asterisk in the first column indicates that at least one mapping unit in the series is made up of two or more kinds of soil, and these the first column

Soil series and map symbol	Buildings of 3 stories or less with basements	Septic tank disposal fields	Sewage lagoons
Abell: AbB [1]	Severe: seasonal high water table; occasional overflow.	Moderate to severe: seasonal high water table; occasional overflow.	Moderate to severe: slope; occasional overflow.
Alluvial land: Ad	Severe: flooding	Severe: flooding	Severe: flooding; moderate to rapid permeability.
Altavista:			
AfA [1]	Moderate to severe: seasonal high water table; flooding.	Severe: flooding	Severe: flooding
AfB [1]	Moderate to severe: seasonal high water table; flooding.	Moderate to severe: seasonal high water table; flooding.	Moderate to severe: moderate permeability; slope; flooding.
AfC2	Moderate: seasonal high water table; slope.	Moderate: seasonal high water table; slope.	Severe: slope
Appling:			
ApC3	Moderate: moderate shrink-swell potential; slope.	Moderate: moderate permeability; slope.	Severe: slope
ApE3	Severe: slope; moderate shrink-swell potential.	Severe: slope; moderate permeability.	Severe: slope
AgB2, AlB2, AmB2	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: moderate permeability; slope.
AgD2, AlC, AlD2, AmD2	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope
AgE2, AlE2	Severe: slope	Severe: slope	Severe: slope
Augusta:			
AuA [1]	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: flooding
AuB	Severe: seasonal high water table.	Severe: seasonal high water table.	Moderate: slope; moderate permeability.
*Buncombe: Bn, Bt. For Toccoa part of Bt, see the Toccoa series.	Severe: flooding	Severe: flooding	Severe: flooding; rapid permeability.
Cecil:			
CcB2, CeB2, CfB2	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: slope; moderate permeability.
CcD2, CeD2, CfD2	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope
CcE2, CeE2, CfE2	Severe: slope	Severe: slope	Severe: slope
ClB3, CmB3	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: slope; moderate permeability.
ClD3, CmD3	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope
ClE3	Severe: slope	Severe: slope	Severe: slope
Chewacla: Cn	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: flooding

See footnote at end of table.

of soils for community and recreational uses

soils may have different properties and limitations. The reader should follow carefully the instructions for referring to another series in of this table]

Local roads and streets	Lawns, landscaping, and golf fairways	Camping areas	Picnic areas
Moderate to severe: occasional overflow.	Slight to moderate: occasional overflow.	Moderate to severe: occasional overflow.	Moderate: occasional overflow.
Severe: flooding	Moderate: flooding	Severe: flooding	Moderate: flooding.
Severe: flooding	Moderate: flooding	Severe: flooding	Moderate: flooding.
Moderate: flooding; fair traffic-supporting capacity.	Slight to moderate: flooding	Moderate to severe: moderately well drained; flooding.	Moderate: flooding.
Moderate: slope; fair traffic-supporting capacity.	Moderate: slope	Moderate: slope; moderately well drained.	Moderate: slope.
Moderate to severe: poor material for subgrade.	Moderate: slope; clay loam surface layer.	Moderate: slope; clay loam surface layer.	Moderate: slope; clay loam surface layer.
Severe: slope; poor material for subgrade.	Severe: slope; clay loam surface layer.	Severe: slope; clay loam surface layer.	Severe: slope; clay loam surface layer.
Moderate to severe: poor material for subgrade.	Slight	Slight	Slight.
Moderate to severe: poor material for subgrade.	Moderate: slope	Moderate: slope	Moderate: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate to severe: somewhat poorly drained; flooding.	Moderate: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Moderate: seasonal high water table.
Moderate: somewhat poorly drained.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Severe: flooding	Severe: flooding; sandy surface layer.	Severe: flooding	Moderate: flooding; sandy surface layer.
Moderate to severe: poor material for subgrade.	Slight	Slight	Slight.
Moderate to severe: poor material for subgrade; slope.	Moderate: slope	Moderate: slope	Moderate: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate to severe: poor material for subgrade.	Moderate: clay loam surface layer.	Moderate: clay loam surface layer.	Moderate: clay loam surface layer.
Moderate to severe: poor material for subgrade; slope.	Moderate: slope; clay loam surface layer.	Moderate: slope; clay loam surface layer.	Moderate: slope; clay loam surface layer.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: flooding	Severe: flooding	Severe: flooding; seasonal high water table.	Moderate: flooding; seasonal high water table.

TABLE 8.—*Estimated degree and kinds of limitations*

Soil series and map symbol	Buildings of 3 stories or less with basements	Septic tank disposal fields	Sewage lagoons
Colfax: CoB	Severe: seasonal high water table.	Severe: slow permeability; seasonal high water table.	Moderate: slope
Congaree: Cr	Severe: flooding	Severe: flooding	Severe: flooding
Creedmoor:			
CsB2	Severe: seasonal high water table; high shrink-swell potential.	Severe: very slow permeability.	Moderate: slope
CsC2	Severe: high shrink-swell potential.	Severe: very slow permeability.	Severe: slope
Cullen:			
CuB2	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: slope; moderate permeability.
CuD2	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope
CuE2	Severe: slope	Severe: slope	Severe: slope
CvB3	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: slope; moderate permeability.
CvD3	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope
Enon:			
EnB2	Severe: high shrink-swell potential.	Severe: slow permeability	Moderate: slope
EnC2	Severe: high shrink-swell potential.	Severe: slow permeability	Severe: slope
EoC3	Severe: high shrink-swell potential.	Severe: slow permeability	Moderate to severe: slope
Georgeville:			
GeB2	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: slope; moderate permeability.
GeD2	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope
GeE2	Severe: slope	Severe: slope	Severe: slope
GgB3	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: slope; moderate permeability.
GgD3	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope
Goldston:			
GoC	Severe: shallowness to bedrock	Severe: shallowness to bedrock	Severe: moderately rapid permeability; shallowness to bedrock.
GoD	Severe: shallowness to bedrock	Severe: shallowness to bedrock	Severe: slope; shallowness to bedrock; moderately rapid permeability.
GoF	Severe: slope; shallowness to bedrock.	Severe: slope; shallowness to bedrock.	Severe: slope; shallowness to bedrock; moderately rapid permeability.

See footnote at end of table.

of soils for community and recreational uses—Continued

Local roads and streets	Lawns, landscaping, and golf fairways	Camping areas	Picnic areas
Moderate: somewhat poorly drained; fair material for subgrade.	Moderate: seasonal high water table; fragipan.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding.
Severe: poor material for subgrade; high shrink-swell potential.	Moderate: sandy loam surface layer.	Moderate: seasonal high water table; very slow permeability.	Slight.
Severe: poor material for subgrade; high shrink-swell potential.	Moderate: sandy loam surface layer.	Moderate: very slow permeability.	Moderate: slope.
Moderate to severe: poor material for subgrade.	Slight	Slight	Slight.
Moderate to severe: slope; poor material for subgrade.	Moderate: slope	Moderate: slope	Moderate: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate to severe: poor material for subgrade.	Moderate: clay loam surface layer.	Moderate: clay loam surface layer.	Moderate: clay loam surface layer.
Moderate to severe: slope; poor material for subgrade.	Moderate: slope; clay loam surface layer.	Moderate: slope; clay loam surface layer.	Moderate: slope; clay loam surface layer.
Severe: poor material for subgrade; high shink-swell potential.	Slight	Moderate: slow permeability	Slight.
Severe: poor material for subgrade; high shrink-swell potential.	Moderate: slope	Moderate: slow permeability	Slight.
Severe: poor material for subgrade; high shrink-swell potential.	Moderate: slope; clay loam surface layer.	Moderate: slope; clay loam surface layer.	Moderate: slope; clay loam surface layer.
Moderate to severe: poor material for subgrade.	Slight	Slight	Slight.
Moderate to severe: poor material for subgrade; slope.	Moderate: slope	Moderate: slope	Moderate: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate to severe: poor material for subgrade.	Moderate: silty clay loam surface layer.	Moderate: silty clay loam surface layer.	Moderate: silty clay loam surface layer.
Moderate to severe: slope; poor material for subgrade.	Moderate: silty clay loam surface layer; slope.	Moderate: slope; silty clay loam surface layer.	Moderate: slope; silty clay loam surface layer.
Moderate: slope; shallowness to bedrock.	Moderate: slope; shallowness to bedrock.	Slight to moderate: slope	Slight to moderate: slope.
Moderate: slope; shallowness to bedrock.	Moderate: slope; shallowness to bedrock.	Moderate: slope	Moderate: slope.
Severe: slope; shallowness to bedrock.	Severe: slope	Severe: slope	Severe: slope.

TABLE 8.—*Estimated degree and kinds of limitations*

Soil series and map symbol	Buildings of 3 stories or less with basements	Septic tank disposal fields	Sewage lagoons
Grover:			
GrB2	Moderate: moderate shrink-swell potential; shallowness to bedrock.	Moderate: moderate permeability; shallowness to bedrock.	Moderate: slope; moderate permeability; shallowness to bedrock.
GrD2	Moderate: slope; moderate shrink-swell potential; shallowness to bedrock.	Moderate: slope; moderate permeability; shallowness to bedrock.	Severe: slope
Gullied land-Cecil complex: GuE. Onsite investigation required.			
Helena:			
HeB, HfB2	Severe: high shrink-swell potential; seasonal high water table.	Severe: slow permeability	Moderate: slope
HeC2, HfC2	Severe: high shrink-swell potential.	Severe: slow permeability	Severe: slope
Herndon:			
HnB2	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: slope; moderate permeability.
HnD2	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope
HrB3	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: slope; moderate permeability.
HrD3	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope
Iredell:			
IrB, IrB2	Severe: high shrink-swell potential; seasonal high water table.	Severe: slow permeability; shallowness to bedrock.	Moderate: slope
IrC2	Severe: high shrink-swell potential; seasonal high water table.	Severe: slow permeability; shallowness to bedrock.	Severe: slope
Louisa:			
LoD	Severe: shallowness to bedrock.	Severe: shallowness to bedrock.	Severe: slope; shallowness to bedrock; moderately rapid permeability.
LoF, LsE3	Severe: slope; shallowness to bedrock.	Severe: slope; shallowness to bedrock.	Severe: slope; shallowness to bedrock; moderately rapid permeability.
Louisburg:			
LuC, LuD	Severe: shallowness to bedrock.	Severe: shallowness to bedrock.	Severe: shallowness to bedrock; moderately rapid permeability; slope.
LuF	Severe: shallowness to bedrock; slope.	Severe: shallowness to bedrock; slope.	Severe: shallowness to bedrock; slope; moderately rapid permeability.
Madison:			
MaB2	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: slope; depth to bedrock; moderate permeability.
MaD2	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope
McB3	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: slope; shallowness to bedrock; moderate permeability.

See footnote at end of table.

of soils for community and recreational uses—Continued

Local roads and streets	Lawns, landscaping, and golf fairways	Camping areas	Picnic areas
Moderate: fair material for subgrade.	Moderate: sandy loam surface layer.	Slight	Slight.
Moderate: slope; fair material for subgrade.	Moderate: slope; sandy loam surface layer.	Moderate: slope	Moderate: slope.
Severe: poor material for subgrade; high shrink-swell potential.	Slight	Moderate: slow permeability; seasonal high water table.	Slight to moderate: coarse fragments on surface.
Severe: poor material for subgrade; high shrink-swell potential.	Moderate: slope	Moderate: slow permeability; coarse fragments on surface; slope.	Moderate: slope; coarse fragments on surface.
Moderate to severe: poor material for subgrade.	Slight	Slight	Slight.
Moderate to severe: slope; poor material for subgrade.	Moderate: slope	Moderate: slope	Moderate: slope.
Moderate to severe: poor material for subgrade.	Moderate: silty clay loam surface layer.	Moderate: silty clay loam surface layer.	Moderate: silty clay loam surface layer.
Moderate to severe: poor material for subgrade.	Moderate: slope; silty clay loam surface layer.	Moderate: slope; silty clay loam surface layer.	Moderate: slope; silty clay loam surface layer.
Severe: poor material for subgrade; high shrink-swell potential.	Slight	Moderate: slow permeability; seasonal high water table.	Slight.
Severe: poor material for subgrade; high shrink-swell potential.	Moderate: slope	Moderate: slow permeability; slope.	Moderate: slope.
Severe: shallowness to bedrock.	Severe: shallowness to bedrock.	Moderate: slope	Moderate: slope.
Severe: slope; shallowness to bedrock.	Severe: slope; shallowness to bedrock.	Severe: slope	Severe: slope.
Moderate: slope; shallowness to bedrock.	Moderate: slope; shallowness to bedrock; sandy loam surface layer.	Moderate: slope	Moderate: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate to severe: poor material for subgrade.	Slight	Slight	Slight.
Moderate to severe: poor material for subgrade; slope.	Moderate: slope	Moderate: slope	Moderate: slope.
Moderate to severe: poor material for subgrade.	Moderate: clay loam surface layer.	Moderate: clay loam surface layer.	Moderate: clay loam surface layer.

TABLE 8.—*Estimated degree and kinds of limitations*

Soil series and map symbol	Buildings of 3 stories or less with basements	Septic tank disposal fields	Sewage lagoons
Madison—Continued			
McD3	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope
MdE2	Severe: slope	Severe: slope	Severe: slope
Masada:			
MeB2	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: slope; moderate permeability.
MeD2	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope
MeE	Severe: slope	Severe: slope	Severe: slope
Mayodan:			
MfB2	Moderate: moderate shrink-swell potential.	Moderate: moderate to moderately slow permeability.	Moderate: slope; moderate permeability.
MfD2	Moderate: slope; moderate shrink-swell potential.	Moderate: slope: moderate to moderately slow permeability.	Severe: slope
Mecklenburg:			
MkB2	Severe: high shrink-swell potential.	Severe: slow permeability	Moderate: slope
MkC2	Severe: high shrink-swell potential.	Severe: slow permeability	Severe: slope
Mecklenburg, loamy subsoil variant:			
MlB	Severe: shallowness to bedrock.	Severe: shallowness to bedrock.	Severe: shallowness to bedrock.
MlC	Severe: shallowness to bedrock.	Severe: shallowness to bedrock.	Severe: slope; shallowness to bedrock.
MlE, MlE3	Severe: slope; shallowness to bedrock.	Severe: shallowness to bedrock; slope.	Severe: slope; shallowness to bedrock.
Orange:			
OrB, OrB2	Severe: high shrink-swell potential; seasonal high water table.	Severe: slow permeability; seasonal high water table.	Moderate: slope
OrC2	Severe: high shrink-swell potential; seasonal high water table.	Severe: slow permeability; seasonal high water table.	Severe: slope
Pacolet:			
PaB2	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: slope; moderate permeability.
PaD2	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope
PaE2	Severe: slope	Severe: slope	Severe: slope
PcC3	Moderate: moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Moderate to severe: slope; moderate permeability.
PcD3	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope

See footnote at end of table.

of soils for community and recreational uses—Continued

Local roads and streets	Lawns, landscaping, and golf fairways	Camping areas	Picnic areas
Moderate to severe: poor material for subgrade; slope.	Moderate: slope; clay loam surface layer.	Moderate: slope; clay loam surface layer.	Moderate: slope; clay loam surface layer.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate to severe: poor material for subgrade.	Slight	Slight	Slight.
Moderate to severe: poor material for subgrade; slope.	Moderate: slope	Moderate: slope	Moderate: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate to severe: poor material for subgrade.	Moderate: sandy loam surface layer.	Slight	Slight.
Moderate to severe: poor material for subgrade; slope.	Moderate: slope; sandy loam surface layer.	Moderate: slope	Moderate: slope.
Severe: poor material for subgrade; high shrink-swell potential.	Slight	Moderate: slow permeability	Slight.
Severe: poor material for subgrade; high shrink-swell potential.	Moderate: slope	Moderate: slope; slow permeability.	Moderate: slope.
Moderate: shallowness to bedrock; fair material for subgrade.	Moderate: shallowness to bedrock.	Slight	Slight.
Moderate: slope; shallowness to bedrock; fair material for subgrade.	Moderate: slope; shallowness to bedrock.	Moderate: slope	Moderate: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Severe: poor material for subgrade; high shrink-swell potential.	Moderate: seasonal high water table.	Moderate: slow permeability; seasonal high water table.	Slight.
Severe: poor material for subgrade; high shrink-swell potential.	Moderate: slope; seasonal high water table.	Moderate: seasonal high water table: slope.	Moderate: slope.
Moderate to severe: poor material for subgrade.	Slight	Slight	Slight.
Moderate to severe: slope; poor material for subgrade.	Moderate: slope	Moderate: slope	Moderate: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate to severe: poor material for subgrade.	Moderate: slope; clay loam surface layer.	Moderate: slope; clay loam surface layer.	Moderate: slope; clay loam surface layer.
Moderate to severe: slope; poor material for subgrade.	Moderate: slope; clay loam surface layer.	Moderate: slope; clay loam surface layer.	Moderate: slope; clay loam surface layer.

TABLE 8.—*Estimated degree and kinds of limitations*

Soil series and map symbol	Buildings of 3 stories or less with basements	Septic tank disposal fields	Sewage lagoons
Pinkston:			
PkC	Severe: shallowness to bedrock.	Severe: shallowness to bedrock.	Severe: shallowness to bedrock; moderately rapid permeability; slope.
PkE	Severe: shallowness to bedrock; slope.	Severe: shallowness to bedrock; slope.	Severe: slope; shallowness to bedrock; moderately rapid permeability.
Roanoke: Ro	Severe: seasonal high water table; high shrink-swell potential; flooding.	Severe: slow permeability; seasonal high water table; flooding.	Severe: flooding
Starr: SrB [1]	Moderate to severe: moderate shrink-swell potential; flooding.	Slight to severe: flooding	Severe: moderately rapid permeability; flooding.
State: StB	Severe: flooding	Severe: flooding	Severe: flooding
Toccoa: To	Severe: flooding	Severe: flooding	Severe: flooding; moderately rapid permeability.
Turbeville:			
TuB2	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: slope; moderate permeability.
TuD2	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope
TuF2	Severe: slope	Severe: slope	Severe: slope
TvB3	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: slope; moderate permeability.
TvD3	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope
Vance:			
VaB2, VcB2	Moderate: moderately high shrink-swell potential.	Severe: slow permeability	Moderate: slope
VaD2, VcC2, VcD2	Moderate: slope; moderately high shrink-swell potential.	Severe: slow permeability	Severe: slope
Wedowee:			
WdB2	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: slope; moderate permeability.
WdD2	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope
*Wehadkee: We, Wh, Wk. For Chewacla part of Wk, see Chewacla series.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: flooding
Wickham:			
WlB	Moderate: moderate shrink-swell potential.	Moderate: moderate permeability.	Moderate: slope; moderate permeability.
WlC2	Moderate: slope; moderate shrink-swell potential.	Moderate: slope; moderate permeability.	Severe: slope

See footnote at end of table.

of soils for community and recreational uses—Continued

Local roads and streets	Lawns, landscaping, and golf fairways	Camping areas	Picnic areas
Moderate: shallowness to bedrock.	Moderate: shallowness to bedrock.	Moderate: slope	Moderate: slope.
Severe: slope	Moderate to severe: slope; shallowness to bedrock.	Severe: slope	Severe: slope.
Severe: poorly drained; flooding; poor material for subgrade; high shrink-swell potential.	Severe: seasonal high water table.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table.
Moderate to severe: fair material for subgrade; flooding.	Slight to moderate: flooding	Slight to severe: flooding	Slight to moderate: flooding.
Moderate: flooding	Moderate: flooding	Severe: flooding	Moderate: flooding.
Severe: flooding	Severe: flooding	Severe: flooding	Moderate: flooding.
Moderate to severe: poor material for subgrade.	Slight	Slight	Slight.
Moderate to severe: slope; poor material for subgrade.	Moderate: slope	Moderate: slope	Moderate: slope.
Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Moderate to severe: poor material for subgrade.	Moderate: clay loam surface layer.	Moderate: clay loam surface layer.	Moderate: clay loam surface layer.
Moderate to severe: poor material for subgrade; slope.	Moderate: slope; clay loam surface layer.	Moderate: slope; clay loam surface layer.	Moderate: slope; clay loam surface layer.
Severe: poor material for subgrade; moderately high shrink-swell potential.	Slight	Moderate: slow permeability	Slight.
Severe: poor material for subgrade; moderately high shrink-swell potential.	Moderate: slope	Moderate: slope; slow permeability.	Moderate: slope.
Moderate to severe: poor material for subgrade.	Slight	Slight	Slight.
Moderate to severe: slope; poor material for subgrade.	Moderate: slope	Moderate: slope	Moderate: slope.
Severe: flooding; poorly drained.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.
Moderate: fair material for subgrade.	Slight	Slight	Slight.
Moderate: slope; fair material for subgrade.	Moderate: slope	Moderate: slope	Moderate: slope.

TABLE 8.—*Estimated degree and kinds of limitations*

Soil series and map symbol	Buildings of 3 stories or less with basements	Septic tank disposal fields	Sewage lagoons
Wilkes:			
WmB	Severe: shallowness to bedrock.	Severe: shallowness to bedrock; moderately slow permeability.	Severe: shallowness to bedrock.
WmD, WnC3	Severe: shallowness to bedrock.	Severe: shallowness to bedrock; moderately slow permeability.	Severe: slope; shallowness to bedrock.
WmF, WnF3	Severe: shallowness to bedrock; slope.	Severe: shallowness to bedrock; slope; moderately slow permeability.	Severe: slope; shallowness to bedrock.
Worsham: Wo, Wr	Severe: seasonal high water table.	Severe: seasonal high water table; slow permeability.	Slight

[1] Some low-lying areas of this soil are subject to occasional flooding or overflow for brief periods, and the limitations to all uses are severe in those areas.

Formation, Morphology, and Classification of the Soils

This section contains three main parts. The first part discusses the factors of soil formation as they relate to the soils of Charlotte County. The second part describes important processes in the development of soil horizons. The third part explains the current system of soil classification and places the soil series in some of the categories of the current system.

Factors of Soil Formation

Soils are formed through the interaction of five major factors. They are climate, plant and animal life, parent material, topography, and time (*3*). The relative influence of each factor generally varies from place to place. Local variations in soils are due to differences in kind of parent material and in topography and drainage. In places one factor may dominate the formation of a soil and determine most of its properties.

Climate

Charlotte County has a warm continental climate. Average annual rainfall is about 43 inches, and the average annual air temperature is between 54° and 59° F. The climate is uniform throughout the county. Rainfall is well distributed throughout the year, but normally July and August are the months of highest rainfall. This type of climate causes rapid leaching, which has removed plant nutrients and organic matter from the surface horizons of many of the soils.

Most of the soils have well-developed horizons. The soil is frozen for only short periods and only to shallow depths; consequently, weathering and translocation of insoluble materials are accelerated. Although calcium is present in some of the parent rocks, leaching has prevented the accumulation of free carbonate of lime. Nearly all the soils are acid; the reaction in the subsoil ranges from neutral to very strongly acid.

Plant and animal life

All living organisms are important to soil formation. These include vegetation, animals, bacteria, and fungi. Plants supply organic debris; animals such as earthworms, cicada, and burrowing animals help to keep the soil open and porous. Soil bacteria and other micro-organisms act to decompose plant material and transform it into organic matter that is incorporated into the soil.

Organic matter did not accumulate in large quantities in the soils of Charlotte County. The soils of the county have developed under a forest vegetation. In addition, the climate favored rapid decay of plant material, oxidation or organic matter, and leaching.

Man has greatly influenced the surface layer of the soil where he has cleared the forests and plowed the land. He has added fertilizers, mixed some of the soil horizons, and has even moved soil materials from place to place.

Parent material

Two general classes of parent material have given rise to the soils of Charlotte County: residual material in place, derived from the decomposition of the underlying rocks; and transported material that has been moved from its original position and deposited on lower slopes, in depressions, and along drainageways. Both classes of parent material were derived from the two major geologic rock systems of the county—the Precambrian and the Triassic.

PRECAMBRIAN ROCKS.—An intricate pattern of Precambrian rocks underlies much of the county. These rocks are separated into three major divisions, which are, in the order of their extent and their contribution to soil formation, (1) Columbia granite, (2) Wissahickon schist and gneiss, and (3) hornblende gabbro gneiss and schist (*4*).

Columbia granite occurs as intrusions in many of the older rock formations. It is very extensive throughout the county. The largest area underlies the western part of the county. It extends from Prince Edward County to the Roanoke River. This rock is also the main constituent of

of soils for community and recreational uses—Continued

Local roads and streets	Lawns, landscaping, and golf fairways	Camping areas	Picnic areas
Moderate: shallowness to bedrock.	Moderate: shallowness to bedrock.	Moderate: moderately slow permeability.	Slight.
Moderate: shallowness to bedrock; slope.	Moderate: slope; shallowness to bedrock.	Moderate: slope; moderately slow permeability.	Moderate: slope.
Severe: slope; shallowness to bedrock.	Severe: slope; shallowness to bedrock.	Severe: slope	Severe: slope.
Severe: poorly drained; poor subgrade material.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.

the multiple rock formations that underlie nearly all the central and western parts of the county from Drakes Branch to Campbell County. This large area is divided by a large strip of Wissahickon formation and by numerous dikes and sills of hornblende gabbro gneiss and kyanite schist. In the western part, Columbia granite is the principal rock formation underlying the Appling, Cecil, and Louisburg soils and, near the dikes, the Wilkes and Helena soils.

Two distinct facies of Columbia granite are common in the county. They are (1) Columbia granite injections into hornblende gabbro gneiss and schist, and (2) Shelton granite-gneiss facies. The first extends roughly from Madisonville to the Roanoke River, and from Phenix to the Roanoke River. It underlies soils of the Cecil, Appling, Wilkes, and Cullen series. The Shelton granite-gneiss facies might be called the native rock formation, because most of the other formations have intruded this one. It extends from Campbell County to about 2 miles east of Red House and from Prince Edward County to the Roanoke River through Drakes Branch. The largest area underlies Helena, Wilkes, and Vance soils in the northern part of the county.

Wissahickon schist and gneiss probably are the most complex geological formations in the southern Piedmont area. Many different soils have developed from material that weathered from these rocks. The highly micaceous parts of this formation have contributed material to the Appling, Cecil, Cullen, Grover, Louisa, Madison, and Wilkes series. In the eastern part of the county near Drakes Branch, these Wissahickon rocks gradually merge into rocks composed of volcanic material common in the Virginia District of Virginia and North Carolina (*5*). These sedimentary rocks of volcanic origin comprise that part of the county described as the "slate belt." They can be classified into two major groups, (1) basic and (2) acidic. The basic rocks are greenstone schist over which soils of the Orange and Goldston series formed and, to a lesser extent, the Georgeville and Herndon series. The acidic rocks include Aaron slate and Hyco-quartz porphyry. In essence, the acidic rock is quartzitic sericite schist. Major soils associated with these materials are of the Georgeville, Herndon, and Goldston series.

Intruding the "slate belt" is a formation known as Red Oak granite. Examples of soils formed in residuum from these materials are the Appling, Helena, Vance, and Cecil, all of which have a fine gravelly sandy loam surface layer in this area.

Hornblende gneiss and schist make up the oldest Precambrian intrusive rock formation in the county. They occur in all parts of the county, principally as long narrow dikes that cut both the Wissahickon and the Columbia granite formations. These dikes are wider and more numerous in the central part of the county than elsewhere. Soils developed over this hornblende gneiss and schist formation include the Iredell, Mecklenburg, and Wilkes.

Triassic Rocks.—Two distinct but inextensive areas are underlain by sedimentary rocks formed from Triassic sediment. These areas are along Roanoke Creek and along State Highway No. 47. Along Roanoke Creek the rock is a coarse conglomerate grading in part to a breccia and is composed of various-size fragments in a red, sandy matrix. Soils overlying these sediments are of the Mayodan, Creedmoor, and Pinkston series. Along State Highway No. 47 is a narrow diabase dike of Triassic or post-Triassic age. Rounded boulders weathering in concentric shells are evidence of the dike. Soils developing in residuum of this formation are of the Iredell, Mecklenburg, and Wilkes series.

Transported Materials.—These materials have been deposited in three major landscape positions: (1) upland depressions, foot slopes, and along small intermittent drainageways, (2) stream terraces, and (3) flood plains of streams. Soils that formed in upland depressions, on foot slopes, and along or at the heads of intermittent drainageways are the Abell, Starr, and Worsham. Those that formed on higher and older stream terraces are the Masada and Turbeville; and those formed on the lower stream terraces are the Altavista, Augusta, Roanoke and Wickham. Soils that formed on the flood plains of streams

are the Buncombe, Chewacla, Congaree, Toccoa, and Wehadkee.

Topography

Topography, or relief, and the climate have so modified the effect of the parent material that in many places more than one kind of soil has developed from the same kind of parent material.

Soils having a normal ABC horizonation have developed in undulating to rolling, well-drained areas where the rate of geologic erosion is normal.

In some areas where slopes are strong and surface runoff is rapid, geologic erosion almost keeps pace with rock weathering and soil formation. Soil materials do not remain in place long enough so that a profile of genetically related horizons can develop. In such places, the amount of water that percolates through the soil is small; consequently, leaching and translocation of material are slow.

Soils that developed in level to undulating areas where the internal drainage is slightly retarded are faintly or distinctly mottled in the subsoil horizons. Those that developed in poorly drained, nearly level to depressional areas have gray colors in the subsoil or are prominently mottled there.

Time

The soils of Charlotte County have a wide range in age. with respect to degree of development. Some have been forming in place for a long time and have developed distinct profiles. For example, the Turbeville soils show evidence of advanced weathering and soil development. They have an A2 horizon and a thick Bt horizon.

Two groups of soils, only slightly developed, occur in the county. In one group are soils on flood plains that have not been in place long enough to have developed distinct horizons. The second group consists of steep soils that lack distinct horizons because erosion is constantly removing soil material.

Morphology of Soils

This subsection contains two main parts. The first part gives a brief discussion of horizon nomenclature. The second describes the processes involved in the development of horizons.

Major soil horizons

The effects of the soil-forming factors can be distinguished by the different layers, or soil horizons, in a soil profile. The profile extends from the surface of the soil downward to materials that are little altered by the soil-forming processes.

Most soils contain three major horizons, called A, B, and C (*8*). These major horizons may be further subdivided by the use of Arabic numbers and lowercase letters to indicate changes within one horizon. An example is the Bx horizon that represents a fragipan layer within the B horizon.

The A horizon is the surface layer and is the layer that contains the largest accumulation of organic matter. The A horizon is also the layer of maximum leaching or eluviation of clay and iron. When considerable leaching has taken place, an A2 horizon is formed. The A2 horizon of some soils in Charlotte County shows brownish colors resulting from oxidation of iron.

The B horizon lies beneath the A horizon and is commonly called the subsoil. It is the horizon of maximum accumulation, or illuviation, of clay, iron, aluminum, or other compounds that have been leached from the A horizon. In some soils the B horizon is formed by alteration in place rather than from illuviation. The alteration may be caused by the oxidation and reduction of iron or by the weathering to clay minerals. The B horizon is generally firmer than the A horizon and has blocky or prismatic structure. It generally is of a lighter color than the A1 horizon, but darker than the C horizon. Some soils have not developed a B horizon.

The C horizon is below the A or B horizon. It consists of materials that are little altered by many of the soil-forming processes but may be modified by weathering.

Processes of soil horizon differentiation

There are several processes involved in the formation of soil horizons in the soils of Charlotte County. These include the accumulation of organic matter, the leaching of soluble salts, reduction and translocation of iron, the formation of soil structure, and some translocation and loss of clay minerals, aluminum, silica, and iron. These processes are continually taking place and generally at the same time throughout the profile.

The accumulation of organic matter takes place with the decomposition of plant residue. This process darkens the surface layer and helps form the A1 horizon. Organic matter, once it has been lost, takes a long time to replace.

Many soils in Charlotte County have distinct subsoil horizons. It is believed that some of the lime and other soluble salts are leached before translocation of iron and clay takes place. Many factors affect this leaching, such as the kinds of salts originally present, the depth to which the soil solution percolates, and the texture of the soil profile.

Well drained and moderately well drained soils in Charlotte County generally have red to yellowish-brown subsoil horizons. These colors are mainly due to thin coatings of iron oxides, but in some profiles the colors may be inherited from the reddish materials in which the soils developed. Weak to medium development of subangular blocky structure has taken place, and in many soils the subsoil contains more clay than the overlying surface horizon.

The reduction and transfer of iron is associated mainly with the wetter, more poorly drained soils. This process is called gleying. Poorly drained soils, such as the Roanoke, Wehadkee, and Worsham, have a subsoil and underlying material that are grayish colored, which indicates reduction and transfer of iron. Moderately well drained to somewhat poorly drained soils have yellowish-brown to gray mottles, indicating the segregation of iron.

A fragipan has developed in the subsoil of the Colfax soils. This horizon is very firm and brittle when moist and hard when dry. Soil particles are tightly packed so that bulk density is high and pore space is low. Genesis of this horizon is not fully understood, but studies show that swelling and shrinking take place in alternating wet and dry periods. This may account for the tight packing of soil particles and also a gross polygonal pattern of cracks in

the fragipan. Clay, silica, and oxides of aluminum are the most likely cementing agents that cause brittleness and hardness.

Classification of Soils

Soils are classified so that we can more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationship to one another and to the whole environment, and to develop principles that help us to understand their behavior and their response to manipulation. First through classification, and then through use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

Thus in classification, soils are placed in narrow categories that are used in detailed soil surveys so that knowledge about the soils can be organized and used in managing farms, fields, and woodlands; in developing rural areas; in engineering work; and in many other ways. Soils are placed in broad classes to facilitate study and comparison in large areas, such as countries and continents.

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 (*3*) and later revised (*7*). The system currently used was adopted for general use by the National Cooperative Soil Survey in 1965. It is under continual study (*6*, *9*). Therefore, readers interested in developments of the current system should search the latest literature available.

The soil series of Charlotte County are placed in some categories of the current system in table 9. Placement of some soil series in the current system may change as more precise information becomes available.

The current system of classification has six categories. Beginning with the most inclusive, the categories are order, suborder, great group, subgroup, family, and series. Following are brief descriptions of each of the six categories in the system.

ORDERS.—Ten soil orders are recognized. They are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate these soil orders are those that tend to give broad climatic groupings of soils. The exceptions to this are the Entisols, Histosols, and, to some extent, the Inceptisols, which occur in many different kinds of climate.

TABLE 9.—*Soil series classified according to the current system of classification*

Series	Family	Subgroup	Order
Abell	Fine-loamy, mixed, thermic	Aquic Hapludults	Ultisols.
Altavista	Fine-loamy, mixed, thermic	Aquic Hapludults	Ultisols.
Appling	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Augusta	Fine-loamy, mixed, thermic	Aeric Ochraquults	Ultisols.
Buncombe	Mixed, thermic	Typic Udipsamments	Entisols.
Cecil	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Chewacla	Fine-loamy, mixed, thermic	Fluvaquentic Dystrochrepts	Inceptisols.
Colfax	Fine-loamy, mixed, thermic	Aquic Fragiudults	Ultisols.
Congaree	Fine-loamy, mixed, nonacid, thermic	Typic Udifluvents	Entisols.
Creedmoor	Clayey, mixed, thermic	Aquic Hapludults	Ultisols.
Cullen	Clayey, mixed, thermic	Typic Hapludults	Ultisols.
Enon	Fine, mixed, thermic	Ultic Hapludalfs	Alfisols.
Georgeville	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Goldston	Loamy-skeletal, siliceous, thermic	Ruptic-Ultic Dystrochrepts	Inceptisols.
Grover	Fine-loamy, micaceous, thermic	Typic Hapludults	Ultisols.
Helena	Clayey, mixed, thermic	Aquic Hapludults	Ultisols.
Herndon	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Iredell	Fine, montmorillonitic, thermic	Typic Hapludalfs	Alfisols.
Louisa	Loamy, micaceous, thermic, shallow	Ruptic-Ultic Dystrochrepts	Inceptisols.
Louisburg	Coarse-loamy, mixed, thermic	Ruptic-Ultic Dystrochrepts	Inceptisols.
Madison	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Masada	Clayey, mixed, thermic	Typic Hapludults	Ultisols.
Mayodan	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Mecklenburg	Fine, mixed, thermic	Ultic Hapludalfs	Alfisols.
Mecklenburg, loamy subsoil variant	Fine-loamy, mixed, thermic	Ultic Hapludalfs	Alfisols.
Orange	Fine, montmorillonitic, thermic	Albaquic Hapludalfs	Alfisols.
Pacolet	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Pinkston	Coarse-loamy, mixed, thermic	Ruptic-Ultic Dystrochrepts	Inceptisols.
Roanoke	Clayey, mixed, thermic	Typic Ochraquults	Ultisols.
Starr	Fine-loamy, mixed, thermic	Fluventic Dystrochrepts	Inceptisols.
State	Fine-loamy, mixed, thermic	Typic Hapludults	Ultisols.
Toccoa	Coarse-loamy, mixed, nonacid, thermic.	Typic Udifluvents	Entisols.
Turbeville	Clayey, mixed, thermic	Typic Paleudults	Ultisols.
Vance	Clayey, mixed, thermic	Typic Hapludults	Ultisols.
Wedowee	Clayey, kaolinitic, thermic	Typic Hapludults	Ultisols.
Wehadkee	Fine-loamy, mixed, nonacid, thermic.	Typic Fluvaquents	Entisols.
Wickham	Fine-loamy, mixed, thermic	Typic Hapludults	Ultisols.
Wilkes	Loamy, mixed, thermic, shallow	Typic Hapludalfs	Alfisols.
Worsham	Clayey, mixed, thermic	Typic Ochraquults	Ultisols.
Worsham, fragipan variant	Clayey, kaolinitic, thermic	Typic Fragiaquults	Ultisols.

Each order has been given a name consisting of a word of three or four syllables ending in *sols*, for example, Ult-i-sols.

Table 9 shows the four soil orders in Charlotte County. They are Alfisols, Entisols, Inceptisols, and Ultisols.

Alfisols are soils that have a clay-enriched B horizon that is relatively high in base saturation. In Charlotte County this order includes soils that were formerly called Lithosols, Planosols, and Reddish-Brown Lateritic soils.

Entisols are recent soils. They do not have genetic horizons or they have only the beginnings of such horizons. In Charlotte County this order includes soils formerly classified as Low-Humic Gley soils and Alluvial soils.

Inceptisols most commonly are found on young, but not recent, land surfaces; hence, their name is derived from the Latin *inceptum*, for beginning. In Charlotte County this order includes soils formerly called Alluvial soils and Lithosols.

Ultisols are soils that have a clay-enriched B horizon that is low in base saturation. In Charlotte County this order includes soils that have been called Red-Yellow Podzolic soils, Gray-Brown Podzolic soils, Planosols, Low-Humic Gley soils, and Red-Yellow Podzolic soils that are integrading toward Reddish-Brown Lateritic soils.

SUBORDERS.—Each order is subdivided into suborders, primarily on the basis of those soil characteristics that seem to produce classes having the greatest genetic similarity. The suborders narrow the broad climatic ranges permitted in the orders. The soil properties used to separate suborders are mainly those that reflect either the presence or absence of waterlogging or soil differences resulting from the climate or vegetation. The names of suborders have two syllables. The last syllable indicates the order. An example is Udult (Ud, for humid, and ult, from Ultisol).

GREAT GROUPS.—Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and other features. The horizons used to make separations are those in which clay, iron, or humus have accumulated or those that have pans that interfere with growth of roots or movement of water. The features used are the self-mulching properties of some clays, and major differences in chemical composition, mainly calcium, magnesium, sodium, potassium, and the like. The names of great groups have three or four syllables and are made by adding a prefix to the name of the suborder. An example is Fragiudult (Fragi meaning fragipan, ud for humid, and ult, from Ultisols). The great group is not shown separately in table 9, because it is the last word in the name of the subgroup.

SUBGROUPS.—Great groups are subdivided into subgroups, one representing the central (typic) segment of the group and others, called intergrades, that have properties of the group and also have one or more properties of another group, suborder, or order. Subgroups may also be made in those instances where soil properties intergrade outside of the range of any other great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group. An example is Aquic Fragiudults (these have colors indicating wetness within a depth of 30 inches).

FAMILIES.—Families are separated within a subgroup primarily on the basis of properties important to the growth of plants or behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence. A family name consists of a series of adjectives preceding the subgroup name. The adjectives are the class names for such soil characteristics as texture and mineralogy that are used as family differentiae (see table 9). An example is the fine-loamy, mixed, thermic family of Aquic Fragiudults.

SERIES.—The series is a group of soils that have major horizons that except for texture of the surface layer, are similar in important characteristics and in arrangement in the profile. They are given the name of a geographic location near the place where that series was first observed and mapped. An example is the Colfax series.

Nomenclature

The nomenclature for the classes in each of the four highest categories is for the most part connotative. The formative elements come chiefly from the classical languages. Many of the roots are familiar and thus help us to visualize the soil. For example, the Colfax series is classified as Aquic Fragiudult. From the formative elements one can visualize that the Colfax soils must be somewhat wet (Aquic), contain a fragipan (fragi), have characteristics associated with a humid climate (ud, from the Latin *udus* for humid), and be old soils (ult, from the Latin *ultimus* for last) in terms of degree of development.

The names are distinctive for the classes in each category, so that a name itself will indicate the category to which a given class belongs. Moreover, the names are designed so that each subgroup by its name is placed with the great group, suborder, and order with which it is identified. For example, the name Aquic Fragiudults indicates a subgroup. Furthermore, from the name, one can identify the great group (Fragiudults), the suborder (Udults) and the order (Ultisols).

General Nature of the County

This section provides general information about the county. It describes the physiography, relief, drainage, water resources, and climate. It also discusses the history and development and gives recent information about transportation and farming. The agricultural statistics used are mainly from records of the U.S. Bureau of the Census.

Physiography, Relief, and Drainage

Charlotte County is irregularly shaped and lies entirely within the Piedmont physiographic province. In Virginia this province lies between the Blue Ridge province on the west and the Coastal Plain province on the east.

The general surface features of Charlotte County are those of a moderately high plateau, which is so dissected by numerous streams that the surface relief ranges from undulating and rolling to hilly, steep, and broken. The areas of relatively mild relief are mainly on the broader interstream ridges and on stream terraces. The areas of hilly, steep, or broken relief are on narrow interstream ridges and on the comparatively short slopes to drainage-

ways. On first bottoms near streams and in places on terraces, the relief is level or nearly level.

The average elevation ranges from 350 to 450 feet. The general slope of the county is toward the south and east. Drainage is well established in most places on the uplands, but many of the interstream areas are slowly drained because they are nearly level or have a slowly permeable subsoil. The terrace lands have good drainage in all except some of the level or nearly level areas, where drainage is poor. Some of the soils of first bottoms have good drainage, but large areas are poorly drained and artificial drainage is necessary for cultivation. On many of the steeper slopes, which are mostly near major streams, excessive runoff of surface water causes an erosion hazard.

The county is drained by the Roanoke River. Major tributaries of this stream within the county are Turnip Creek and Cub Creek in the western part, Roanoke Creek in the central part, and Bluestone Creek in the eastern part. Springs are numerous, and the streams they feed are perennial.

Water Resources [6]

Charlotte County is underlain mostly by igneous and metamorphic rocks that trend across the county in a northeasterly direction. Sedimentary strata occur in a small area east of Charlotte Court House. The zone of unconsolidated soil, alluvium, and weathered rock is normally 40 to 60 feet thick, but in places it is as thick as 100 feet.

Ground water is present in the lower part of the unconsolidated zone and in fractures and thin weathered zones present in the bedrock. The water table is generally at a depth of about 30 to 40 feet in the unconsolidated material.

The dug wells and springs that obtain water from the zone of unconsolidated material generally have only small yields during periods of normal precipitation and may become dry during periods of drought. This, and the increased consumption of water, has caused many supplies from shallow sources to be replaced by drilled wells that generally are more productive, more sanitary, and not seriously affected by drought.

Few wells have been drilled to secure large yields; therefore, the capacity of bedrock aquifers is unknown in most areas of the county. Most existing wells have been located for convenience near homes and roads in high areas; 75 percent of them are less than 150 feet deep, and 90 percent of them yield less than 15 gallons per minute. The average yield of wells could probably be increased by drilling in more favorable locations, such as in valleys, draws, or upland flat areas. A few of the wells 200 to 400 feet deep yield 25 to 50 gallons of water per minute, most of which was encountered at depths of less than 250 feet. Only two wells have been drilled deeper than 400 feet. The deepest one, 553 feet deep, produced only 7 gallons per minute from two fractures between 200 and 250 feet below ground surface. It is probable that 50 or more gallons per minute can be obtained from wells at carefully selected sites throughout the county where recharge to permeable rocks is plentiful, but in some locations more than one well would be required to supply this amount of water. The largest reported single yield is 75 gallons per minute, which was obtained from depths of less than 185 feet in a 235-foot well near Drakes Mills.

The ground water from most sources is reported to be soft and free from excessive mineralization; locally the water may be hard or contain excessive iron, part of which may result from corrosion of iron in the water system. Shallow ground water, such as that obtained from most springs and dug wells, is sometimes less mineralized than water from greater depths.

Charlotte County has the Roanoke or Staunton River and a part of Buggs Island Lake as its southern boundary. These provide large supplies of available water. Smaller supplies can be obtained from the smaller tributaries feeding into the Roanoke River, such as Cub Creek and Roanoke Creek. Cub Creek has a high runoff, but because it is a small creek, the flow is low during droughts. Roanoke Creek also has a large runoff but has different characteristics from Cub Creek.

Stream gaging stations are located on the Roanoke River at Brookneal just above the county line, on the Roanoke River near Randolph, on Cub Creek at Phenix, and on Roanoke Creek at Saxe. Another small stream, Bluestone Creek, is in the southern part of the county, but no streamflow records are available for that creek. Information on the quality of flow and the chemical characteristics of the water is available. Flow duration and high- and low-flow sequence data are available for the following four gaging stations.

	Average streamflow per day (gallons)
Roanoke River near Brookneal	1,564 million
Roanoke River near Randolph	2,080 million
Cub Creek at Phenix	60 million
Roanoke Creek at Saxe	73 million

The water in the Roanoke or Staunton River is quite soft, and the river offers good possibilities for large industrial uses. The water of the tributaries, such as Cub Creek and Roanoke Creek, is very soft and of good quality, but storage reservoirs would be needed if a fairly large volume were required.

In 1962, a 42.5-acre impoundment was completed on Spring Creek near Keysville for the purpose of floodwater retardation, municipal water storage, and recreation. The impoundment has 620 acre-feet of flood control storage. Also, the town of Keysville has additional storage for its municipal water supply of approximately 200 acre-feet.

Climate [7]

Charlotte County, in common with much of central Virginia, has warm summers, relatively mild winters, and normally adequate rainfall. The county is located well inland from the Atlantic Ocean, which has only a very slight moderating effect on the climate. The Appalachian Mountains to the west tend to lessen the intensity of winter storms crossing the area.

The county lies in the paths of warm, moist air currents moving from the south or southwest and of cold, dry air currents moving toward the south and east from Canada. These alternating currents frequently bring sharp changes

[6] Prepared by the Staff, Department of Conservation and Economic Development, Division of Mineral Resources, Commonwealth of Virginia.

[7] Prepared by M. H. Bailey, climatologist for Virginia, National Weather Service, U.S. Department of Commerce, Blacksburg, Virginia.

in the day-to-day weather and contribute greatly to the large variations in weather from one season to another. Daily weather in one part of the county sometimes differs from that in another part, but differences in elevation are not large enough to cause significant differences in climate. Therefore, the climatological data in tables 10 and 11 may be considered approximately applicable to all of the county.

Average annual temperatures vary slightly from one year to another but are mostly 54° to 59° F. Days with temperatures higher than 95° or lower than 15° are infrequent, and temperatures higher than 100° or below zero are very rare. Maximum temperatures reach 90° or higher on an average of about 43 days per year, and minimum temperatures are 32° or lower on about 98 days per year. Prolonged periods of very cold or very warm weather are unusual. There are some mild spells in winter, and occasional periods of dry, mild weather relieve stretches of warm, humid weather in summer.

The average growing season, or the average number of days between the last freezing temperature in spring and the first freezing temperature in fall, is about 190 days. This growing season is long enough to allow proper maturity of many kinds of crops. The pasture season is slightly longer, but the winter months are cold enough that feed and shelter are required for livestock.

The average monthly precipitation varies greatly from year to year for any given month. All months of the year receive very light rainfall in some years and also occasionally receive excessive rainfall. Although rainfall is

TABLE 10.—*Temperature and precipitation data, Charlotte County, Va.*

Month	Temperature				Precipitation			
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with—		Average total	One year in 10 will have—		Average depth of snow on days with snow cover
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—	
	°F.	°F.	°F.	°F.	*Inches*	*Inches*	*Inches*	*Inches*
January	48	26	64	10	3.6	1.5	5.8	5.6
February	50	27	65	14	3.2	1.5	5.3	4.0
March	57	34	73	22	3.7	2.2	5.3	2.7
April	69	44	83	33	3.6	1.9	5.0	[1]
May	78	53	87	42	3.9	1.7	6.3	[1]
June	84	60	93	52	3.7	1.3	6.2	[1]
July	88	65	95	59	4.6	1.6	6.5	0
August	86	64	94	57	4.5	1.5	8.6	0
September	80	57	90	46	3.7	1.1	10.5	0
October	71	45	83	33	2.8	.8	6.0	[1]
November	60	36	73	25	2.8	1.0	5.9	.3
December	49	26	63	13	3.3	1.6	5.2	1.5
Year	68	45	[2] 98	[3] 6	43.4	33.2	55.0	14.1

[1] Less than 0.05 inch.
[2] Average annual highest temperature.
[3] Average annual lowest temperature.

TABLE 11.—*Probabilities of last freezing temperatures in spring and first in fall*

[Data for Charlotte Court House, Charlotte County, Va.]

Probability	Dates for given probability and temperature				
	32° F. or lower	28° F. or lower	24° F. or lower	20° F. or lower	16° F. or lower
Spring:					
1 year in 10 later than	April 30	April 17	April 5	March 29	March 16.
2 years in 10 later than	April 25	April 11	March 30	March 22	March 8.
5 years in 10 later than	April 16	March 31	March 19	March 8	February 21.
Fall:					
1 year in 10 earlier than	October 11	October 18	November 1	November 12	November 20.
2 years in 10 earlier than	October 16	October 23	November 6	November 17	November 26.
5 years in 10 earlier than	October 23	November 1	November 15	November 27	December 7.

greater during the summer months, it is often insufficient because summer is the time when growing plants demand the greatest amount of moisture and evaporation is highest. Also, summer rainfall occurs mostly as thundershowers, some of which are heavy and result in considerable runoff. Every few years, on the average, hurricanes pass inland across the Atlantic Coast late in summer or in fall and cause extremely large rains that generally last 2 to 3 days.

The average annual relative humidity is 68 percent; it is slightly lower in spring and a little higher late in summer.

The prevailing wind is from the southwest, although winds blow from other directions part of the time. In summer southerly winds are more frequent, and in winter northwesterly winds prevail. The average windspeed is 8 miles per hour, and winds generally are moderate, but there are a few times each year when windstorms may cause scattered local damage in the county.

On an average day, clouds cover about one-half of the sky between sunrise and sunset. The cloud cover is least in fall but interferes with sunshine least in summer when overcast days are less frequent.

History and Development

Charlotte County was formed from Lunenburg County in 1764. Settlement in this area had started perhaps 40 years earlier, for the community south of Phenix, once called the Caldwell Settlement, had been settled by 1738. Cub Creek Church, the oldest Presbyterian Church south of the James River, was built in 1735.

Patrick Henry, who was born in Hanover County, came to Charlotte County in 1795 and is buried at his home, Red Hill, near the Campbell County line. In 1957 the Patrick Henry Memorial Foundation dedicated as a national shrine, a replica of the last home of this Virginia patriot. Another point of interest in Charlotte County is Roanoke Plantation, the home of John Randolph who represented Virginia in both houses of the United States Congress between 1799 and 1825. Other well-known colonial homes still standing in the county are Edgehill, Greenfield, and Roanoke Bridge.

Transportation

One of Virginia's main north-south highways, U.S. Highway No. 360 and No. 15, runs through the eastern edge of Charlotte County. State Highway No. 40 crosses the county from east to west. Other state roads join all parts of the county with these main routes.

One railroad enters Charlotte County near Keysville, and one branch of that line crosses the county through Drakes Branch while another branch runs southeast into Lunenburg County. That railroad connects the area with Washington, D.C., and other cities to the north, and with Atlanta, Birmingham, and other cities to the south.

Another railroad also crosses the county, entering from Campbell County and running northeast into Prince Edward County. It is a direct line to the ports of Hampton Roads and to Roanoke and points west.

The two railroads provide daily freight service to the county.

Farming

Farming has been the leading occupation since the county was settled. The main crops are tobacco, corn, wheat, and hay. Livestock is raised on most farms and dairying is an important source of income in the county.

In 1964, Charlotte County had 1,271 farms totaling 184,357 acres. The percent of the county in farms was 62, and the other 38 percent was mostly privately owned land used to grow wood products. Off-farm employment is common in the county. The recent trend suggests that the number of farms will decrease and that the average size of the farms probably will become larger.

The amount of cropland in 1964 was 51,907 acres; woodland on farms, 105,979 acres; pasture land, 21,306 acres; and other land in farms 5,165 acres. Principal sources of farm income in 1964 were field crops, dairy products, livestock, wood products, and poultry. The major source of farm income was derived from tobacco crops; both flue-cured and burley tobacco are grown.

Literature Cited

(1) ALLAN, P. F., GARLAND, L. E., and DUGAN, R. F.
1963. RATING NORTHEASTERN SOILS FOR THEIR SUITABILITY FOR WILDLIFE HABITAT. N. Am. Wildlife and Natural Res. Trans., pp. 247–261, illus.

(2) AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS.
1961. STANDARD SPECIFICATIONS FOR HIGHWAY MATERIALS AND METHODS OF SAMPLING AND TESTING. Ed. 8, 2 v., illus. Washington, D.C.

(3) BALDWIN, M., KELLOGG, C. E., and THORP, JAMES.
1938. SOIL CLASSIFICATION. U.S. Dept. Agr. Ybk.: 979–1001, illus.

(4) JONAS, A. I.
1932. GEOLOGY OF THE KYANITE BELT OF VIRGINIA. Bul. 38 Va. Geol. Survey, Univ. Va.

(5) LANEY, F. B.
1917. GEOLOGY AND ORE DEPOSITS OF VIRGILINA DISTRICT OF VIRGINIA AND NORTH CAROLINA. Bul. XIV, Univ. Va.

(6) SIMONSON, ROY W.
1962. SOIL CLASSIFICATION IN THE UNITED STATES. Sci. 137: 1027–1034.

(7) THORP, JAMES, and SMITH, GUY D.
1949. HIGHER CATEGORIES OF SOIL CLASSIFICATION: ORDER, SUBORDER, AND GREAT SOIL GROUPS. Soil Sci. 67: 117–126.

(8) UNITED STATES DEPARTMENT OF AGRICULTURE.
1951. SOIL SURVEY MANUAL. U.S. Dept. Agr. Handbook 18, 503 pp., illus.

(9) ———
1960. SOIL CLASSIFICATION, A COMPREHENSIVE SYSTEM, 7TH APPROXIMATION. Soil Survey Staff, Soil Conservation Service, 265 pp., illus. [Supplements issued in March 1967 and September 1968]

(10) UNITED STATES DEPARTMENT OF DEFENSE.
1968. UNIFIED SOIL CLASSIFICATION SYSTEM FOR ROADS, AIRFIELDS, EMBANKMENTS, AND FOUNDATIONS. MIL–STD–619B, 30 pp., illus.

Glossary

Acidity. See Reaction, soil.

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at

wilting point. It is commonly expressed as inches of water per inch of soil.

Base saturation. The degree to which material that has base-exchange properties is saturated with exchangeable cations other than hydrogen, expressed as a percentage of the cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 45 percent silt.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A mapping unit consisting of different kinds of soils that occur in such small individual areas or in such an intricate pattern that they cannot be shown separately on a publishable soil map.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Cover crop. A close-growing crop grown primarily to improve and to protect the soil between periods of regular crop production; or a crop grown between trees and vines in orchards and vineyards.

Diversion, or diversion terrace. A ridge of earth generally a terrace, that is built to divert runoff from its natural course and, thus, to protect areas downslope from the effects of such runoff.

Erosion. The wearing away of the land surface by wind (sandblast), running water, and other geological agents.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants, when other growth factors such as light, moisture, temperature, and the physical condition of the soil are favorable.

Flood plain. Nearly level land, consisting of stream sediments that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic-matter content and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur 15 to 40 inches below the surface.

Gleyed soil. A soil in which waterlogging and lack of oxygen have caused the material in one or more horizons to be neutral gray in color. The term "gleyed" is applied to soil horizons with yellow and gray mottling caused by intermittent waterlogging.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, and covered by grass for protection against erosion; used to conduct surface water away from cropland.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rains. The distinction between gully and rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by normal tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage. V-shaped gullies result if the material is more difficult to erode with depth; whereas U-shaped gullies result if the lower material is more easily eroded than that above it.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are ususally called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Internal soil drainage. The downward movement of water through the soil profile. The rate of movement is determined by the texture, structure, and other characteristics of the soil profile and underlying layers, and by height of the water table, either permanent or perched. Relative terms for expressing internal drainage are *none*, *very slow*, *slow*, *medium*, *rapid*, and *very rapid*.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineralogical, and biological properties of the various horizons, and their thickness and arrangement in the soil profile.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few*, *common*, and *many;* size—*fine*, *medium*, and *coarse;* and contrast—*faint*, *distinct*, and *prominent*. The size measurements are these: *fine*, less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium*, ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse*, more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Munsell notation. A system for designating color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with a hue of 10YR, a value of 6, and a chroma of 4.

Parent material. Disintegrated and partly weathered rock from which soil has formed.

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Permeability. The quality that enables the soil to transmit water or air. Terms used to describe permeability and permeability rates, given in inches of water movement per hour, follow. These reflect hydraulic conductivity commonly used in soil survey testing procedure. *Very slow* (less than 0.063 inch per hour); *slow* (0.063 to 0.2 inch per hour); *moderately slow* (0.2 to 0.63 inch per hour); *moderate* (0.63 inch to 2.0 inches per hour); *moderately rapid* (2.0 to 6.3 inches per hour); *rapid* (6.3 to 20.0 inches per hour); and *very rapid* (greater than 20.0 inches per hour).

Productivity (of soil). The present capability of a soil for producing a specified plant or sequence of plants under a specified system of management. It is measured in terms of output, or harvest, in relation to input of production for the specific kind of soil under a specified system of management.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour" soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Mildly alkaline	7.4 to 7.8
Very strongly acid	4.5 to 5.0	Moderately alkaline	7.9 to 8.4
Strongly acid	5.1 to 5.5	Strongly alkaline	8.5 to 9.0
Medium acid	5.6 to 6.0	Very strongly alkaline	9.1 and higher
Slightly acid	6.1 to 6.5		
Neutral	6.6 to 7.3		

Relief. The elevations or inequities of a land surface, considered collectively.

Runoff (hydraulics). The part of the precipitation upon a drainage area that is discharged from the area in stream channels. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Sedimentary rock. A rock composed of particles deposited from suspension in water. The chief sedimentary rocks are conglomerate, from gravel; sandstone, from sand; shale, from clay; and limestone, from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sands have been consolidated into sandstone.

Series, soil. A group of soils developed from a particular type of parent material and having genetic horizons that, except for texture of the surface soil, are similar in differentiating characteristics and in arrangement in the profile.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Stripcropping. Growing crops in a systematic arrangement of strips, or bands, to serve as vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. Technically, the part of the soil below the solum.

Surface layer. A term used in nontechnical soil descriptions for one or more layers above the subsoil. Includes A horizon and part of B horizon; has no depth limit.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportions of fine particles, are *sand*, *loamy sand*, *sandy loam*, *loam*, *silt loam*, *silt*, *sandy clay loam*, *clay loam*, *silty clay loam*, *sandy clay*, *silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil. A presumed fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Upland (geology). Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plain or stream terrace. Land above the lowlands along rivers.

Variant, soil. A soil having properties sufficiently different from those of other known soils to suggest establishing a new soil series, but a soil of such limited known area that creation of a new series is not believed to be justified.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

Weathering. All physical and chemical changes produced in rocks at or near the earth's surface by atmospheric agents. These changes result in more or less complete disintegration and decomposition of the rock.

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GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and the soil series to which the mapping unit belongs. In referring to a capability unit, read the introduction to the section it is in for general information about its management. Other information is given in tables as follows:

Acreage and extent, table 1, p. 5.
Estimated yields, table 2, p. 49.
Use of soils for woodland, table 3, p. 53.
Use of soils for wildlife, table 4, p. 56.
Engineering uses of the soils, tables 5, 6, and 7, pp. 58 through 75.
Limitations of soils for community and recreational uses, table 8, p. 78.

Map symbol	Mapping unit	Page	Capability unit		Woodland group
			Symbol	Page	Number
AbB	Abell soils, 2 to 6 percent slopes	7	IIe-3	45	1
Ad	Alluvial land	7	IIw-1	46	1
AfA	Altavista fine sandy loam, 0 to 2 percent slopes	8	IIw-1	46	3
AfB	Altavista fine sandy loam, 2 to 6 percent slopes	8	IIe-3	45	3
AfC2	Altavista fine sandy loam, 6 to 10 percent slopes, eroded	8	IIIe-1	46	3
AgB2	Appling fine gravelly sandy loam, 2 to 6 percent slopes, eroded	9	IIe-1	45	4
AgD2	Appling fine gravelly sandy loam, 6 to 15 percent slopes, eroded	9	IIIe-1	46	4
AgE2	Appling fine gravelly sandy loam, 15 to 25 percent slopes, eroded	9	IVe-1	47	4
AlB2	Appling fine sandy loam, 2 to 6 percent slopes, eroded	9	IIe-1	45	4
AlC	Appling fine sandy loam, 6 to 10 percent slopes	9	IIe-1	45	4
AlD2	Appling fine sandy loam, 6 to 15 percent slopes, eroded	9	IIIe-1	46	4
AlE2	Appling fine sandy loam, 15 to 25 percent slopes, eroded	9	IVe-1	47	4
AmB2	Appling fine sandy loam, very deep, 2 to 6 percent slopes, eroded	10	IIe-1	45	4
AmD2	Appling fine sandy loam, very deep, 6 to 15 percent slopes, eroded	10	IIIe-1	46	4
ApC3	Appling clay loam, 4 to 10 percent slopes, severely eroded	10	IVe-1	47	5
ApE3	Appling clay loam, 10 to 20 percent slopes, severely eroded	10	VIe-1	48	5
AuA	Augusta fine sandy loam, 0 to 2 percent slopes	11	IIIw-1	47	3
AuB	Augusta fine sandy loam, 2 to 6 percent slopes	11	IIIw-1	47	3
Bn	Buncombe loamy sand	11	IIIs-1	47	11
Bt	Buncombe-Toccoa complex	11	IIIs-1	47	11
CcB2	Cecil fine gravelly sandy loam, 2 to 6 percent slopes, eroded	12	IIe-4	45	4
CcD2	Cecil fine gravelly sandy loam, 6 to 15 percent slopes, eroded	12	IIIe-4	46	4
CcE2	Cecil fine gravelly sandy loam, 15 to 25 percent slopes, eroded	12	IVe-1	47	4
CeB2	Cecil fine sandy loam, 2 to 6 percent slopes, eroded	12	IIe-4	45	4
CeD2	Cecil fine sandy loam, 6 to 15 percent slopes, eroded	13	IIIe-4	46	4
CeE2	Cecil fine sandy loam, 15 to 25 percent slopes, eroded	13	IVe-1	47	4
CfB2	Cecil fine sandy loam, very deep, 2 to 6 percent slopes, eroded	13	IIe-4	45	4
CfD2	Cecil fine sandy loam, very deep, 6 to 15 percent slopes, eroded	13	IIIe-4	46	4
CfE2	Cecil fine sandy loam, very deep, 15 to 25 percent slopes, eroded	13	IVe-1	47	4
ClB3	Cecil clay loam, 2 to 6 percent slopes, severely eroded	13	IIIe-5	47	5
ClD3	Cecil clay loam, 6 to 15 percent slopes, severely eroded	14	IVe-1	47	5
ClE3	Cecil clay loam, 15 to 25 percent slopes, severely eroded	14	VIe-1	48	5
CmB3	Cecil clay loam, very deep, 2 to 6 percent slopes, severely eroded	14	IIIe-5	47	5
CmD3	Cecil clay loam, very deep, 6 to 15 percent slopes, severely eroded	14	IVe-1	47	5
Cn	Chewacla silt loam	15	IIIw-1	47	1
CoB	Colfax fine sandy loam, 2 to 6 percent slopes	15	IIIw-1	47	3
Cr	Congaree silt loam	16	IIw-1	46	1
CsB2	Creedmoor sandy loam, 2 to 6 percent slopes, eroded	17	IIIe-2	46	7
CsC2	Creedmoor sandy loam, 6 to 10 percent slopes, eroded	17	IVe-2	47	7
CuB2	Cullen loam, 2 to 6 percent slopes, eroded	18	IIe-4	45	4
CuD2	Cullen loam, 6 to 15 percent slopes, eroded	18	IIIe-4	46	4
CuE2	Cullen loam, 15 to 25 percent slopes, eroded	18	IVe-1	47	4
CvB3	Cullen clay loam, 2 to 6 percent slopes, severely eroded	18	IIIe-5	47	5
CvD3	Cullen clay loam, 6 to 15 percent slopes, severely eroded	18	IVe-1	47	5
EnB2	Enon fine sandy loam, 2 to 6 percent slopes, eroded	19	IIe-2	45	6
EnC2	Enon fine sandy loam, 6 to 10 percent slopes, eroded	19	IIIe-3	46	6
EoC3	Enon clay loam, 4 to 12 percent slopes, severely eroded	19	IVe-2	47	5
GeB2	Georgeville silt loam, 2 to 6 percent slopes, eroded	20	IIe-4	45	4
GeD2	Georgeville silt loam, 6 to 15 percent slopes, eroded	20	IIIe-4	46	4
GeE2	Georgeville silt loam, 15 to 25 percent slopes, eroded	20	IVe-1	47	4
GgB3	Georgeville silty clay loam, 2 to 6 percent slopes, severely eroded	20	IIIe-5	47	5
GgD3	Georgeville silty clay loam, 6 to 15 percent slopes, severely eroded	20	IVe-1	47	5
GoC	Goldston silt loam, 4 to 10 percent slopes	21	IVe-3	48	8
GoD	Goldston silt loam, 10 to 15 percent slopes	21	VIe-3	48	8
GoF	Goldston silt loam, 15 to 35 percent slopes	21	VIIe-1	49	8
GrB2	Grover sandy loam, 2 to 6 percent slopes, eroded	22	IIe-1	45	4
GrD2	Grover sandy loam, 6 to 15 percent slopes, eroded	22	IIIe-1	46	4
GuE	Gullied land-Cecil complex, moderately steep	22	VIIe-1	49	5
HeB	Helena fine gravelly sandy loam, 2 to 6 percent slopes	23	IIIe-2	46	7
HeC2	Helena fine gravelly sandy loam, 6 to 10 percent slopes, eroded	23	IVe-2	47	7

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GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Page	Capability unit		Woodland group
			Symbol	Page	Number
HfB2	Helena fine sandy loam, 2 to 6 percent slopes, eroded	23	IIIe-2	46	7
HfC2	Helena fine sandy loam, 6 to 10 percent slopes, eroded	23	IVe-2	47	7
HnB2	Herndon silt loam, 2 to 6 percent slopes, eroded	24	IIe-1	45	4
HnD2	Herndon silt loam, 6 to 15 percent slopes, eroded	24	IIIe-1	46	4
HrB3	Herndon silty clay loam, 2 to 6 percent slopes, severely eroded	24	IIIe-5	47	5
HrD3	Herndon silty clay loam, 6 to 15 percent slopes, severely eroded	24	IVe-1	47	5
IrB	Iredell loam, 2 to 6 percent slopes	25	IIIe-2	46	10
IrB2	Iredell loam, 2 to 6 percent slopes, eroded	25	IVe-2	47	10
IrC2	Iredell loam, 6 to 10 percent slopes, eroded	25	VIe-2	48	10
LoD	Louisa fine sandy loam, 6 to 15 percent slopes	26	VIe-3	48	8
LoF	Louisa fine sandy loam, 15 to 35 percent slopes	26	VIIe-1	49	8
LsE3	Louisa and Louisburg soils, 15 to 25 percent slopes, severely eroded	26	VIIe-1	49	8
LuC	Louisburg sandy loam, 4 to 10 percent slopes	26	IVe-3	48	8
LuD	Louisburg sandy loam, 10 to 15 percent slopes	27	VIe-3	48	8
LuF	Louisburg sandy loam, 15 to 35 percent slopes	27	VIIe-1	49	8
MaB2	Madison fine sandy loam, 2 to 6 percent slopes, eroded	27	IIe-4	45	4
MaD2	Madison fine sandy loam, 6 to 15 percent slopes, eroded	27	IIIe-4	46	4
McB3	Madison clay loam, 2 to 6 percent slopes, severely eroded	27	IIIe-5	47	5
McD3	Madison clay loam, 6 to 15 percent slopes, severely eroded	28	VIe-1	48	5
MdE2	Madison and Grover fine sandy loams, 15 to 25 percent slopes, eroded	28	IVe-1	47	4
MeB2	Masada fine sandy loam, 2 to 6 percent slopes, eroded	29	IIe-1	45	4
MeD2	Masada fine sandy loam, 6 to 15 percent slopes, eroded	29	IIIe-1	46	4
MeE	Masada fine sandy loam, 15 to 25 percent slopes	29	IVe-1	47	4
MfB2	Mayodan sandy loam, 2 to 6 percent slopes, eroded	29	IIe-1	45	4
MfD2	Mayodan sandy loam, 6 to 15 percent slopes, eroded	30	IIIe-1	46	4
MkB2	Mecklenburg loam, 2 to 6 percent slopes, eroded	30	IIe-2	45	6
MkC2	Mecklenburg loam, 6 to 12 percent slopes, eroded	30	IIIe-3	46	6
MlB	Mecklenburg loam, loamy subsoil variant, 2 to 6 percent slopes	31	IIIe-4	46	6
MlC	Mecklenburg loam, loamy subsoil variant, 6 to 10 percent slopes	31	IVe-1	47	6
MlE	Mecklenburg loam, loamy subsoil variant, 10 to 25 percent slopes	31	VIe-3	48	6
MlE3	Mecklenburg loam, loamy subsoil variant, 10 to 25 percent slopes, severely eroded	31	VIe-3	48	5
OrB	Orange silt loam, 2 to 6 percent slopes	32	IIIe-2	46	10
OrB2	Orange silt loam, 2 to 6 percent slopes, eroded	32	IVe-2	47	10
OrC2	Orange silt loam, 6 to 10 percent slopes, eroded	32	VIe-2	48	10
PaB2	Pacolet fine sandy loam, 2 to 6 percent slopes, eroded	33	IIe-4	45	4
PaD2	Pacolet fine sandy loam, 6 to 15 percent slopes, eroded	33	IIIe-4	46	4
PaE2	Pacolet fine sandy loam, 15 to 25 percent slopes, eroded	33	IVe-1	47	4
PcC3	Pacolet clay loam, 4 to 10 percent slopes, severely eroded	33	IVe-1	47	5
PcD3	Pacolet clay loam, 10 to 15 percent slopes, severely eroded	33	VIe-1	48	5
PkC	Pinkston fine sandy loam, 6 to 10 percent slopes	34	IVe-3	48	8
PkE	Pinkston fine sandy loam, 10 to 25 percent slopes	34	VIe-3	48	8
Ro	Roanoke silt loam	34	Vw-1	48	2
SrB	Starr loam, 2 to 6 percent slopes	35	IIe-3	45	1
StB	State silt loam, 2 to 6 percent slopes	36	IIe-3	45	1
To	Toccoa fine sandy loam	36	IIw-1	46	11
TuB2	Turbeville fine sandy loam, 2 to 6 percent slopes, eroded	37	IIe-4	45	4
TuD2	Turbeville fine sandy loam, 6 to 15 percent slopes, eroded	37	IIIe-4	46	4
TuF2	Turbeville fine sandy loam, 15 to 35 percent slopes, eroded	37	IVe-1	47	4
TvB3	Turbeville clay loam, 2 to 6 percent slopes, severely eroded	37	IIIe-5	47	5
TvD3	Turbeville clay loam, 6 to 15 percent slopes, severely eroded	37	IVe-1	47	5
VaB2	Vance fine gravelly sandy loam, 2 to 6 percent slopes, eroded	38	IIe-1	45	7
VaD2	Vance fine gravelly sandy loam, 6 to 15 percent slopes, eroded	38	IIIe-1	46	7
VcB2	Vance fine sandy loam, 2 to 6 percent slopes, eroded	38	IIe-1	45	7
VcC2	Vance fine sandy loam, 6 to 10 percent slopes, eroded	38	IIIe-1	46	7
VcD2	Vance fine sandy loam, 10 to 15 percent slopes, eroded	38	IVe-1	47	7
WdB2	Wedowee fine sandy loam, 2 to 6 percent slopes, eroded	39	IIe-1	45	4
WdD2	Wedowee fine sandy loam, 6 to 15 percent slopes, eroded	39	IIIe-1	46	4
We	Wehadkee fine sandy loam, overwash	40	IVw-1	48	2
Wh	Wehadkee silt loam	40	IVw-1	48	2
Wk	Wehadkee-Chewacla complex	40	IVw-1	48	2
WlB	Wickham fine sandy loam, 2 to 6 percent slopes	41	IIe-3	45	1
WlC2	Wickham fine sandy loam, 6 to 10 percent slopes, eroded	41	IIIe-1	46	4
WmB	Wilkes fine sandy loam, 2 to 6 percent slopes	41	IIIe-1	46	8
WmD	Wilkes fine sandy loam, 6 to 15 percent slopes	41	IVe-3	48	8
WmF	Wilkes fine sandy loam, 15 to 35 percent slopes	42	VIIe-1	49	8
WnC3	Wilkes soils, 4 to 10 percent slopes, severely eroded	42	VIe-3	48	9
WnF3	Wilkes soils, 10 to 35 percent slopes, severely eroded	42	VIIe-1	49	9
Wo	Worsham soils	43	Vw-1	48	2
Wr	Worsham soils, fragipan variant	43	Vw-1	48	2

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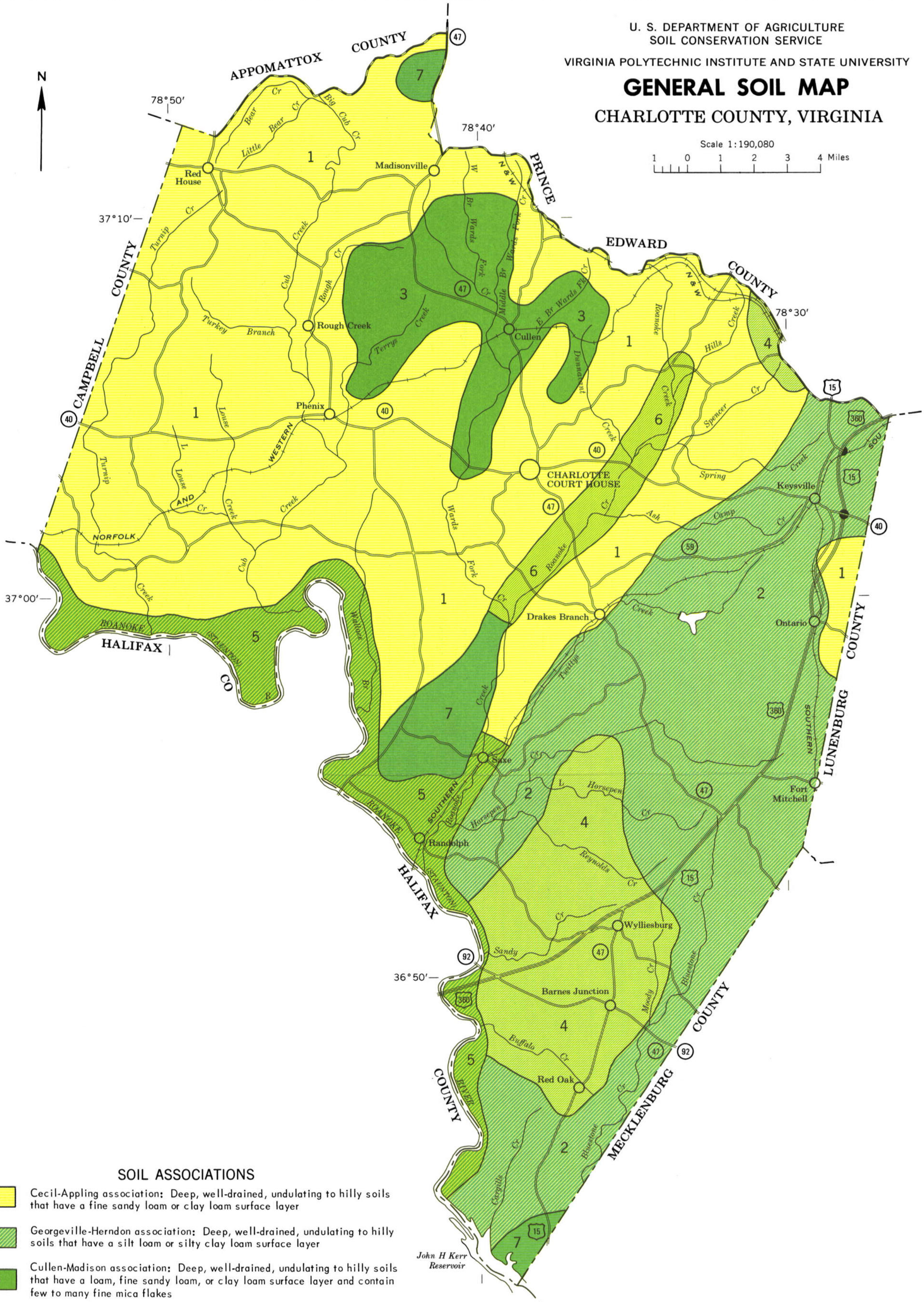
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

GENERAL SOIL MAP

CHARLOTTE COUNTY, VIRGINIA

Scale 1:190,080



SOIL ASSOCIATIONS

1 Cecil-Appling association: Deep, well-drained, undulating to hilly soils that have a fine sandy loam or clay loam surface layer

2 Georgeville-Herndon association: Deep, well-drained, undulating to hilly soils that have a silt loam or silty clay loam surface layer

3 Cullen-Madison association: Deep, well-drained, undulating to hilly soils that have a loam, fine sandy loam, or clay loam surface layer and contain few to many fine mica flakes

4 Appling-Vance-Cecil association: Deep, well-drained, undulating to rolling soils that have q fine gravelly sandy loam surface layer

5 Chewacla-Congaree-Turbeville association: Deep, well-drained to somewhat poorly drained, nearly level to steep soils that have a silt loam, fine sandy loam, or clay loam surface layer

6 Creedmoor-Mayodan-Pinkston association: Deep to moderately deep, moderately well drained to excessively drained, undulating to hilly soils that have a sandy loam or fine sandy loam surface layer

7 Iredell-Vance-Helena association: Moderately deep to deep, moderately well drained to well drained, undulating to rolling soils that have a loam or fine sandy loam surface layer

Compiled 1972

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

CHARLOTTE COUNTY, VIRGINIA

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads

- Divided
- Good motor
- Poor motor
- Trail

Highway markers

- National Interstate
- U. S.
- State or county

Railroads

- Single track
- Multiple track
- Abandoned

Bridges and crossings

- Road
- Trail
- Railroad
- Ferry (FY)
- Ford (FORD)
- Grade
- R. R. over
- R. R. under

Buildings

- School
- Church

Mine and quarry

Gravel pit

Power line

Pipeline

Cemetery

Dams

Levee

Tanks

Well, oil or gas

Forest fire or lookout station

Windmill

Located object

BOUNDARIES

- National or state
- County
- Minor civil division
- Reservation
- Land grant
- Small park, cemetery, airport
- Land survey division corners

DRAINAGE

Streams, double-line

- Perennial
- Intermittent

Streams, single-line

- Perennial
- Intermittent
  - Crossable with tillage implements
  - Not crossable with tillage implements
  - Unclassified

Canals and ditches

Lakes and ponds

- Perennial (water, w)
- Intermittent (int)

Spring

Marsh or swamp

Wet spot

Drainage end or alluvial fan

RELIEF

Escarpments

- Bedrock
- Other

Short steep slope

Prominent peak

Depressions

	Large	Small
Crossable with tillage implements		
Not crossable with tillage implements		
Contains water most of the time		

SOIL SURVEY DATA

Soil boundary and symbol (Dx)

Gravel

Stoniness
- Stony
- Very stony

Rock outcrops

Chert fragments

Clay spot

Sand spot

Gumbo or scabby spot

Made land

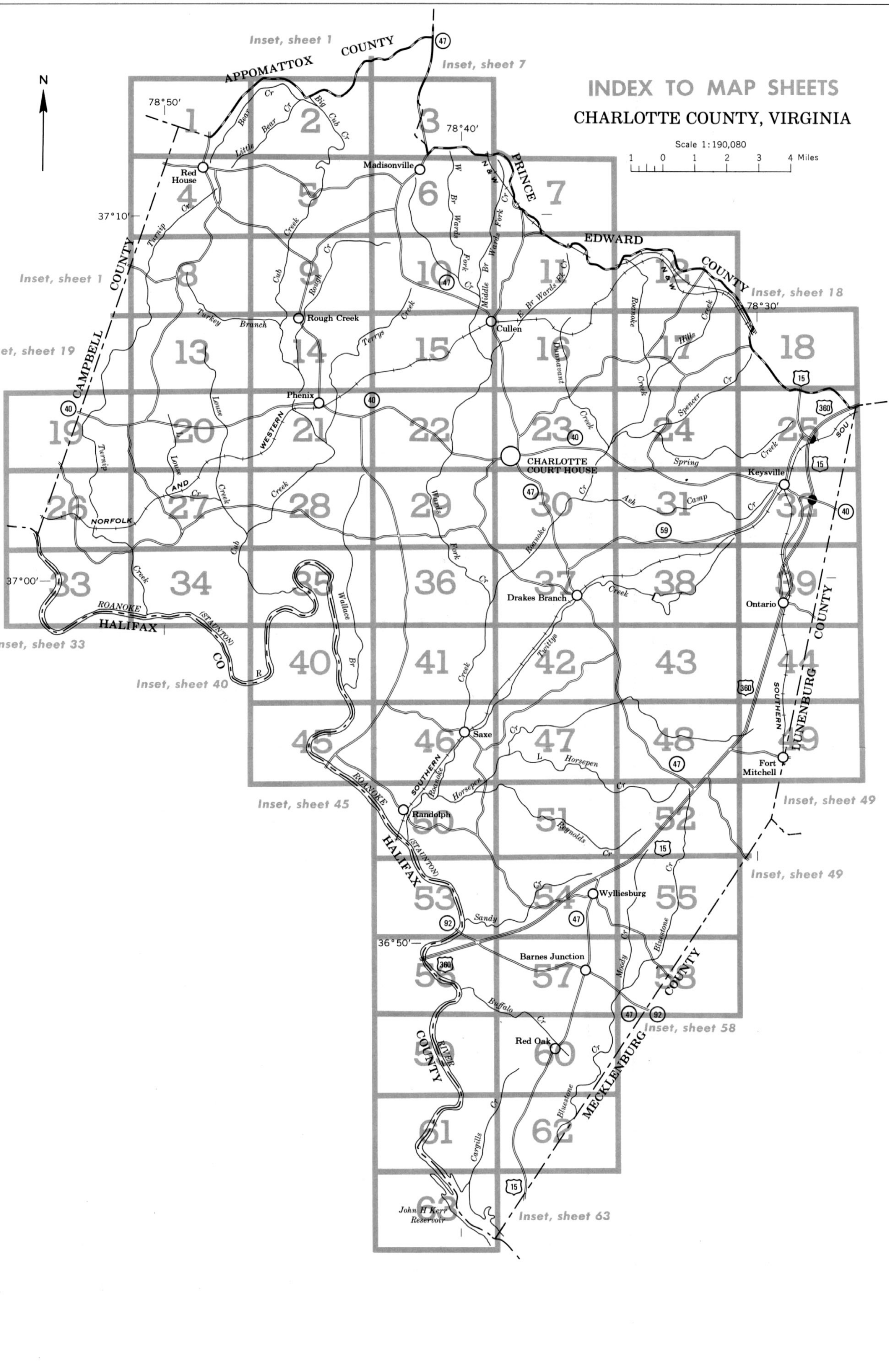
Severely eroded spot

Blowout, wind erosion

Gully

Soil sample site (S)

INDEX TO MAP SHEETS
CHARLOTTE COUNTY, VIRGINIA



SOIL LEGEND

The first capital letter is the initial one of the soil name. A second capital letter, A, B, C, D, E, or F, shows the slope. Symbols without a slope letter are those of nearly level soils. A final number, 2 or 3, in a symbol shows that the soil is eroded or severely eroded.

SYMBOL	NAME
AbB	Abell soils, 2 to 6 percent slopes
Ad	Alluvial land
AfA	Altavista fine sandy loam, 0 to 2 percent slopes
AfB	Altavista fine sandy loam, 2 to 6 percent slopes
AfC2	Altavista fine sandy loam, 6 to 10 percent slopes, eroded
AgB2	Appling fine gravelly sandy loam, 2 to 6 percent slopes, eroded
AgD2	Appling fine gravelly sandy loam, 6 to 15 percent slopes, eroded
AgE2	Appling fine gravelly sandy loam, 15 to 25 percent slopes, eroded
AlB2	Appling fine sandy loam, 2 to 6 percent slopes, eroded
AlC	Appling fine sandy loam, 6 to 10 percent slopes
AlD2	Appling fine sandy loam, 6 to 15 percent slopes, eroded
AlE2	Appling fine sandy loam, 15 to 25 percent slopes, eroded
AmB2	Appling fine sandy loam, very deep, 2 to 6 percent slopes, eroded
AmD2	Appling fine sandy loam, very deep, 6 to 15 percent slopes, eroded
ApC3	Appling clay loam, 4 to 10 percent slopes, severely eroded
ApE3	Appling clay loam, 10 to 20 percent slopes, severely eroded
AuA	Augusta fine sandy loam, 0 to 2 percent slopes
AuB	Augusta fine sandy loam, 2 to 6 percent slopes
Bn	Buncombe loamy sand
Bt	Buncombe-Toccoa complex
CcB2	Cecil fine gravelly sandy loam, 2 to 6 percent slopes, eroded
CcD2	Cecil fine gravelly sandy loam, 6 to 15 percent slopes, eroded
CcE2	Cecil fine gravelly sandy loam, 15 to 25 percent slopes, eroded
CeB2	Cecil fine sandy loam, 2 to 6 percent slopes, eroded
CeD2	Cecil fine sandy loam, 6 to 15 percent slopes, eroded
CeE2	Cecil fine sandy loam, 15 to 25 percent slopes, eroded
CfB2	Cecil fine sandy loam, very deep, 2 to 6 percent slopes, eroded
CfD2	Cecil fine sandy loam, very deep, 6 to 15 percent slopes, eroded
CfE2	Cecil fine sandy loam, very deep, 15 to 25 percent slopes, eroded
ClB3	Cecil clay loam, 2 to 6 percent slopes, severely eroded
ClD3	Cecil clay loam, 6 to 15 percent slopes, severely eroded
ClE3	Cecil clay loam, 15 to 25 percent slopes, severely eroded
CmB3	Cecil clay loam, very deep, 2 to 6 percent slopes, severely eroded
CmD3	Cecil clay loam, very deep, 6 to 15 percent slopes, severely eroded
Cn	Chewacla silt loam
CoB	Colfax fine sandy loam, 2 to 6 percent slopes
Cr	Congaree silt loam
CsB2	Creedmoor sandy loam, 2 to 6 percent slopes, eroded
CsC2	Creedmoor sandy loam, 6 to 10 percent slopes, eroded
CuB2	Cullen loam, 2 to 6 percent slopes, eroded
CuD2	Cullen loam, 6 to 15 percent slopes, eroded
CuE2	Cullen loam, 15 to 25 percent slopes, eroded
CvB3	Cullen clay loam, 2 to 6 percent slopes, severely eroded
CvD3	Cullen clay loam, 6 to 15 percent slopes, severely eroded
EnB2	Enon fine sandy loam, 2 to 6 percent slopes, eroded
EnC2	Enon fine sandy loam, 6 to 10 percent slopes, eroded
EoC3	Enon clay loam, 4 to 12 percent slopes, severely eroded
GeB2	Georgeville silt loam, 2 to 6 percent slopes, eroded
GeD2	Georgeville silt loam, 6 to 15 percent slopes, eroded
GeE2	Georgeville silt loam, 15 to 25 percent slopes, eroded
GgB3	Georgeville silty clay loam, 2 to 6 percent slopes, severely eroded
GgD3	Georgeville silty clay loam, 6 to 15 percent slopes, severely eroded
GoC	Goldston silt loam, 4 to 10 percent slopes
GoD	Goldston silt loam, 10 to 15 percent slopes
GoF	Goldston silt loam, 15 to 35 percent slopes
GrB2	Grover sandy loam, 2 to 6 percent slopes, eroded
GrD2	Grover sandy loam, 6 to 15 percent slopes, eroded
GuE	Gullied land-Cecil complex, moderately steep
HeB	Helena fine gravelly sandy loam, 2 to 6 percent slopes
HeC2	Helena fine gravelly sandy loam, 6 to 10 percent slopes, eroded
HfB2	Helena fine sandy loam, 2 to 6 percent slopes, eroded
HfC2	Helena fine sandy loam, 6 to 10 percent slopes, eroded
HnB2	Herndon silt loam, 2 to 6 percent slopes, eroded
HnD2	Herndon silt loam, 6 to 15 percent slopes, eroded
HrB3	Herndon silty clay loam, 2 to 6 percent slopes, severely eroded
HrD3	Herndon silty clay loam, 6 to 15 percent slopes, severely eroded
IrB	Iredell loam, 2 to 6 percent slopes
IrB2	Iredell loam, 2 to 6 percent slopes, eroded
IrC2	Iredell loam, 6 to 10 percent slopes, eroded
LoD	Louisa fine sandy loam, 6 to 15 percent slopes
LoF	Louisa fine sandy loam, 15 to 35 percent slopes
LsE3	Louisa and Louisburg soils, 15 to 25 percent slopes, severely eroded
LuC	Louisburg sandy loam, 4 to 10 percent slopes
LuD	Louisburg sandy loam, 10 to 15 percent slopes
LuF	Louisburg sandy loam, 15 to 35 percent slopes
MaB2	Madison fine sandy loam, 2 to 6 percent slopes, eroded
MaD2	Madison fine sandy loam, 6 to 15 percent slopes, eroded
McB3	Madison clay loam, 2 to 6 percent slopes, severely eroded
McD3	Madison clay loam, 6 to 15 percent slopes, severely eroded
MdE2	Madison and Grover fine sandy loams, 15 to 25 percent slopes, eroded
MeB2	Masada fine sandy loam, 2 to 6 percent slopes, eroded
MeD2	Masada fine sandy loam, 6 to 15 percent slopes, eroded
MeE	Masada fine sandy loam, 15 to 25 percent slopes
MfB2	Mayodan sandy loam, 2 to 6 percent slopes, eroded
MfD2	Mayodan sandy loam, 6 to 15 percent slopes, eroded
MkB2	Mecklenburg loam, 2 to 6 percent slopes, eroded
MkC2	Mecklenburg loam, 6 to 12 percent slopes, eroded
MlB	Mecklenburg loam, loamy subsoil variant, 2 to 6 percent slopes
MlC	Mecklenburg loam, loamy subsoil variant, 6 to 10 percent slopes
MlE	Mecklenburg loam, loamy subsoil variant, 10 to 25 percent slopes
MlE3	Mecklenburg loam, loamy subsoil variant, 10 to 25 percent slopes, severely eroded
OrB	Orange silt loam, 2 to 6 percent slopes
OrB2	Orange silt loam, 2 to 6 percent slopes, eroded
OrC2	Orange silt loam, 6 to 10 percent slopes, eroded
PaB2	Pacolet fine sandy loam, 2 to 6 percent slopes, eroded
PaD2	Pacolet fine sandy loam, 6 to 15 percent slopes, eroded
PaE2	Pacolet fine sandy loam, 15 to 25 percent slopes, eroded
PcC3	Pacolet clay loam, 4 to 10 percent slopes, severely eroded
PcD3	Pacolet clay loam, 10 to 15 percent slopes, severely eroded
PkC	Pinkston fine sandy loam, 6 to 10 percent slopes
PkE	Pinkston fine sandy loam, 10 to 25 percent slopes
Ro	Roanoke silt loam
SrB	Starr loam, 2 to 6 percent slopes
StB	State silt loam, 2 to 6 percent slopes
To	Toccoa fine sandy loam
TuB2	Turbeville fine sandy loam, 2 to 6 percent slopes, eroded
TuD2	Turbeville fine sandy loam, 6 to 15 percent slopes, eroded
TuF2	Turbeville fine sandy loam, 15 to 35 percent slopes, eroded
TvB3	Turbeville clay loam, 2 to 6 percent slopes, severely eroded
TvD3	Turbeville clay loam, 6 to 15 percent slopes, severely eroded
VaB2	Vance fine gravelly sandy loam, 2 to 6 percent slopes, eroded
VaD2	Vance fine gravelly sandy loam, 6 to 15 percent slopes, eroded
VcB2	Vance fine sandy loam, 2 to 6 percent slopes, eroded
VcC2	Vance fine sandy loam, 6 to 10 percent slopes, eroded
VcD2	Vance fine sandy loam, 10 to 15 percent slopes, eroded
WdB2	Wedowee fine sandy loam, 2 to 6 percent slopes, eroded
WdD2	Wedowee fine sandy loam, 6 to 15 percent slopes, eroded
We	Wehadkee fine sandy loam, overwash
Wh	Wehadkee silt loam
Wk	Wehadkee-Chewacla complex
WlB	Wickham fine sandy loam, 2 to 6 percent slopes
WlC2	Wickham fine sandy loam, 6 to 10 percent slopes, eroded
WmB	Wilkes fine sandy loam, 2 to 6 percent slopes
WmD	Wilkes fine sandy loam, 6 to 15 percent slopes
WmF	Wilkes fine sandy loam, 15 to 35 percent slopes
WnC3	Wilkes soils, 4 to 10 percent slopes, severely eroded
WnF3	Wilkes soils, 10 to 35 percent slopes, severely eroded
Wo	Worsham soils
Wr	Worsham soils, fragipan variant

CHARLOTTE COUNTY, VIRGINIA NO. 1

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Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

1 900 000 FEET

325 000 FEET

295 000 FEET

290 000 FEET

315 000 FEET

1 915 000 FEET

INSET A

1 894 000 FEET

1 896 000 FEET

(Joins inset, sheet 19)

2 000 AND 5 000-FOOT GRID TICKS

INSET B

1 934 000 FEET

1 936 000 FEET

329 000 FEET

327 000 FEET

(Joins inset, sheet 7)

(Joins sheet 2)

2 000-FOOT GRID TICKS

(Joins sheet 8)

(Joins sheet 2)

(Joins sheet 4)

CAMPBELL COUNTY

APPOMATTOX COUNTY

Double Branch

Jamison Creek

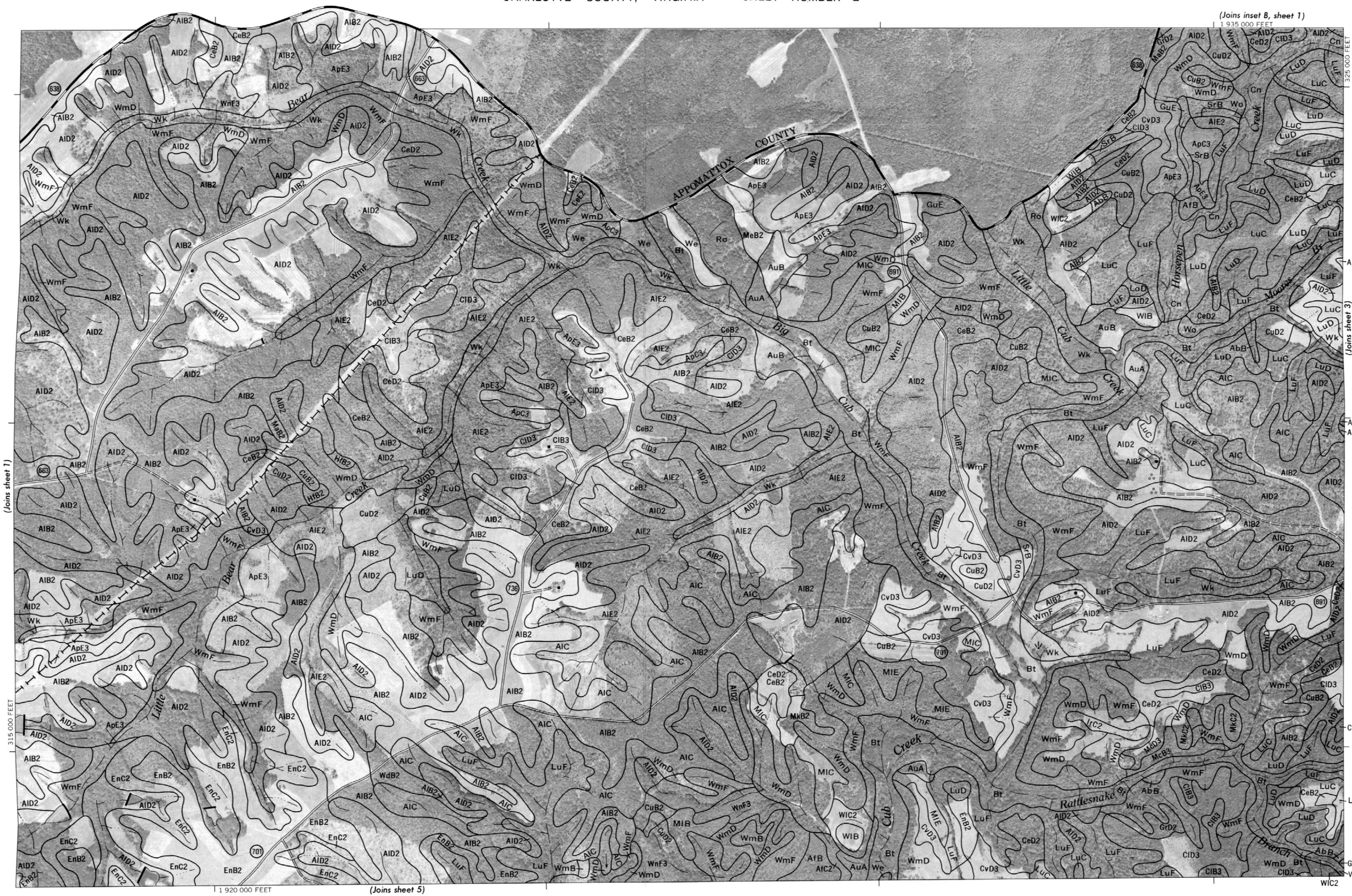
Bear Creek

Little Bear Creek

Scale 1:15 840

1 Mile

5 000 Feet



Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

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CHARLOTTE COUNTY, VIRGINIA NO. 2

CHARLOTTE COUNTY, VIRGINIA NO. 3

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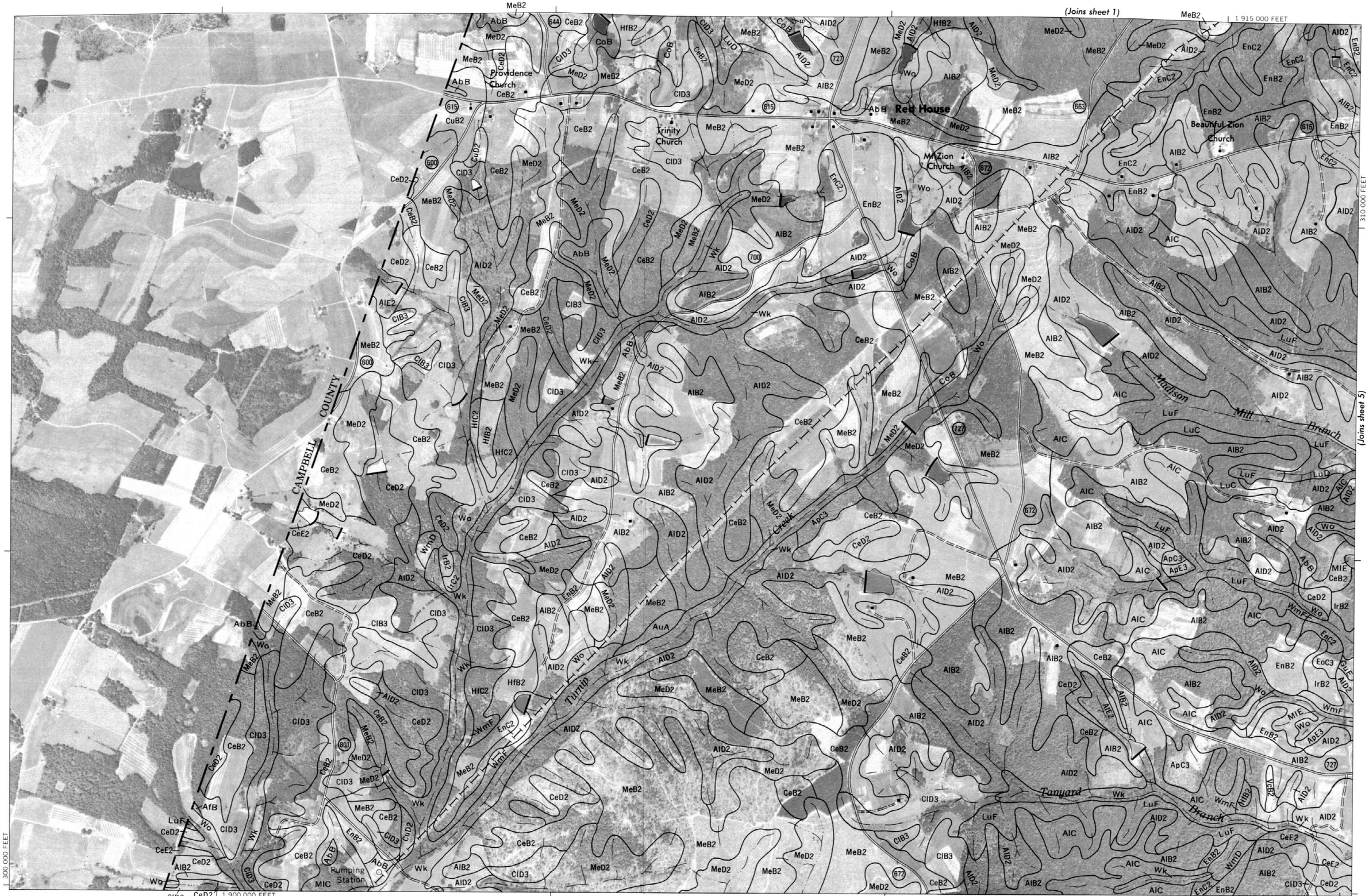
3

N

1 Mile

5 000 Feet

Scale 1:15 840



Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

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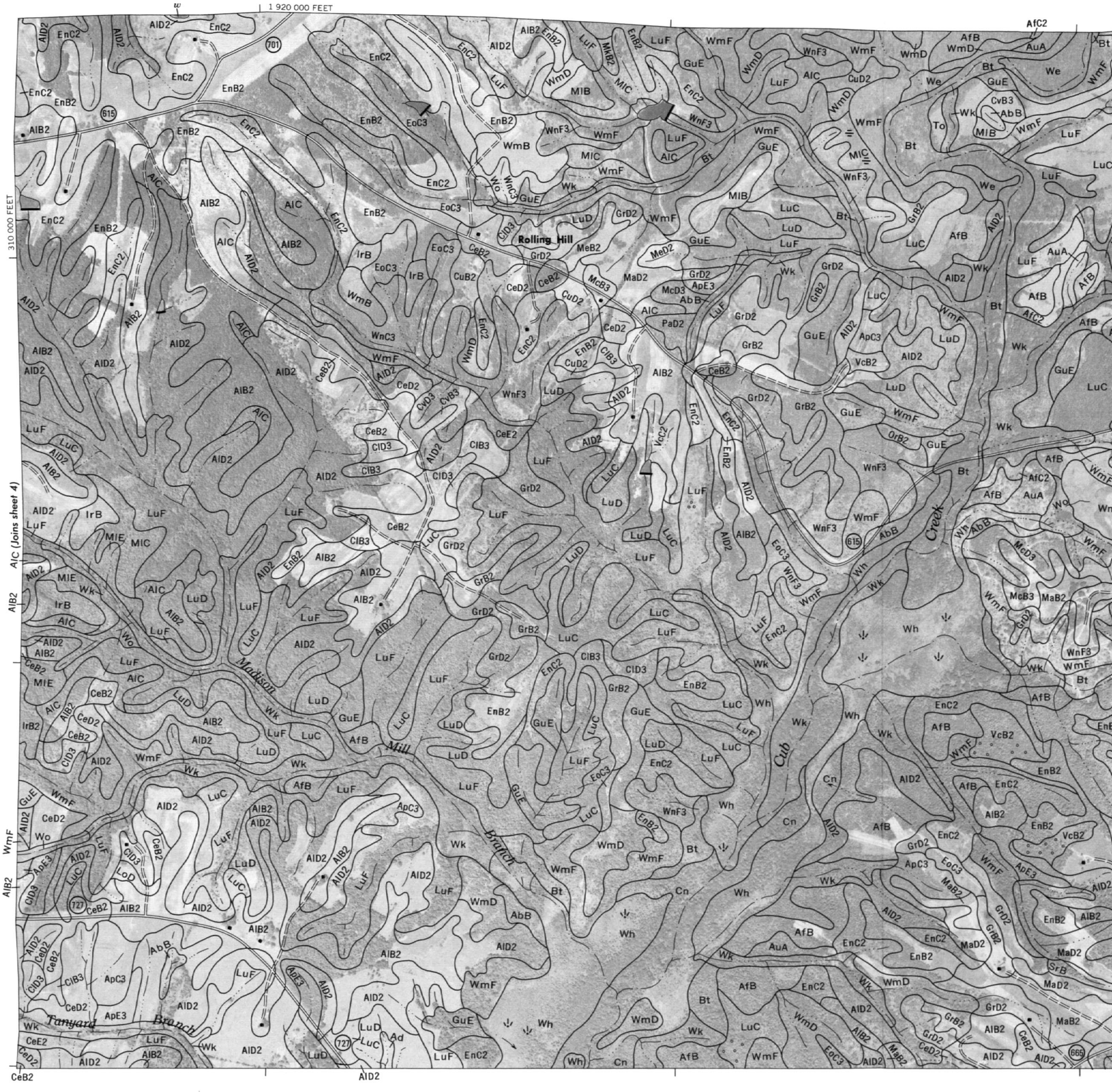
CHARLOTTE COUNTY, VIRGINIA NO. 4



CHARLOTTE COUNTY, VIRGINIA NO. 5

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N

1 Mile 5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 3)

(Joins sheet 5)

(Joins sheet 7)

(Joins sheet 10)

1 955 000 FEET

1 940 000 FEET

1 310 000 FEET

1 300 000 FEET

Madisonville

Centenary Church

Rattlesnake Branch

Jenkins Creek

West Creek

Wards Fork

Middle Branch

Norfolk and Western

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

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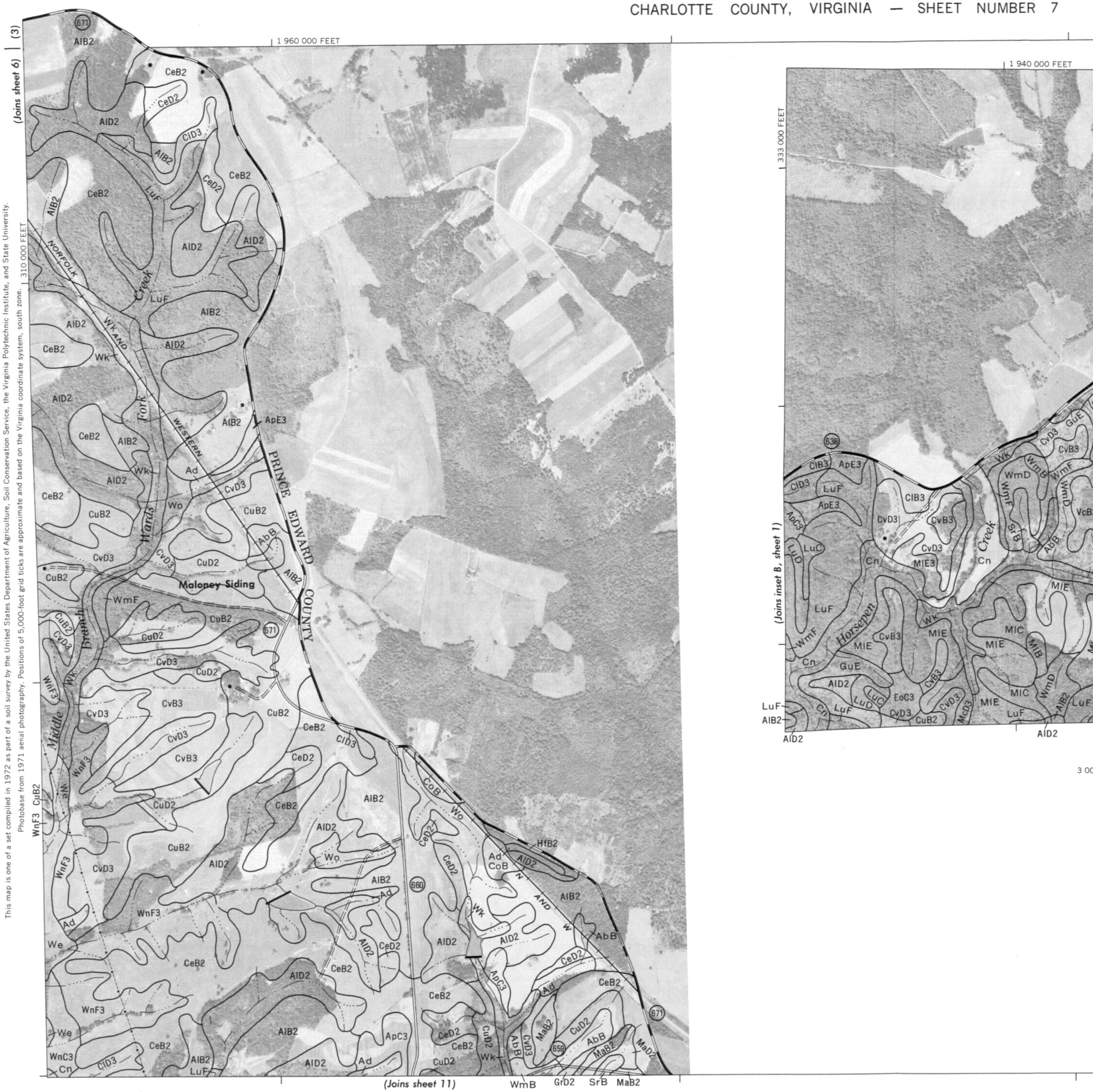
CHARLOTTE COUNTY, VIRGINIA NO. 6



CHARLOTTE COUNTY, VIRGINIA NO. 7

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Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 4)

1 915 000 FEET

1 296 000 FEET

290 000 FEET

1 900 000 FEET

(Joins inset A, sheet 1)

(Joins sheet 13)

(Joins sheet 9)

COUNTY

CAMPBELL

Turnip Creek

Turkey Branch

Old Well

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CHARLOTTE COUNTY, VIRGINIA NO. 8

CHARLOTTE COUNTY, VIRGINIA NO. 9

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Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

9

N

Scale 1:15 840

1 Mile

5 000 Feet

1 920 000 FEET

300 000 FEET

290 000 FEET

1 935 000 FEET

(Joins sheet 5)

(Joins sheet 8)

(Joins sheet 10)

(Joins sheet 14)

Dividing Branch

Cub Creek

Rough Creek

N

1 955 000 FEET

300 000 FEET

(Joins sheet 6)

(Joins sheet 9)

(Joins sheet 11)

(Joins sheet 15)

1 940 000 FEET

290 000 FEET

Vincent Corner

Oak View Church

Wards Fork Mill

Jenkins Creek

West Fork Wards Branch

Middle Wards Branch

Scale 1:15 840

1 Mile 5 000 Feet

0 1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

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CHARLOTTE COUNTY, VIRGINIA NO. 10

CHARLOTTE COUNTY, VIRGINIA NO. 11

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Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

11

N

1 Mile

5 000 Feet

Scale 1:15 840

N

1 Mile
5 000 Feet

Scale 1:15 840

1 995 000 FEET

300 000 FEET

290 000 FEET

1 980 000 FEET

(Joins sheet 11)

(Joins sheet 17)

(Joins inset, sheet 18)

PRINCE EDWARD COUNTY

Abilene

County Line Cross Roads

St Douglas Church

Roanoke Creek

Coldwater Creek

Little Creek

NORFOLK AND WESTERN

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CHARLOTTE COUNTY, VIRGINIA NO. 12

CHARLOTTE COUNTY, VIRGINIA NO. 13

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Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

1 900 000 FEET

285 000 FEET

(Joins inset, sheet 19)

(Joins sheet 8)

(Joins sheet 14)

(Joins sheet 20)

1 915 000 FEET

1 275 000 FEET

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

N

(Joins sheet 9)

(Joins sheet 13)

(Joins sheet 15)

(Joins sheet 21)

1 935 000 FEET

285 000 FEET

275 000 FEET

1 920 000 FEET

Rough Creek

Turkey Branch

Cub Creek

Rough Creek

Cub Creek

Temple Branch

Terrys Creek

Western Creek

Scale 1:15 840

1 Mile

5 000 Feet

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

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CHARLOTTE COUNTY, VIRGINIA NO. 15

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1 940 000 FEET

285 000 FEET

(Joins sheet 14)

(Joins sheet 10)

(Joins sheet 16)

(Joins sheet 22)

1 955 000 FEET

275 000 FEET

N

Scale 1:15 840

1 Mile

5 000 Feet

Cullen

Concord Church

Tarrys

Middle Creek

Austin Creek

Bruncy Creek

Wards Fork

Eastern Bt

WESTERN AND NORFOLK

N

1 Mile

5 000 Feet

Scale 1:15 840

1 975 000 FEET

285 000 FEET

275 000 FEET

1 960 000 FEET

(Joins sheet 11)

(Joins sheet 15)

(Joins sheet 17)

(Joins sheet 23)

Cullen

Wards Fork Creek

Cunningham Branch

Dunnavant Creek

Roanoke Church

WESTERN NORFOLK AND

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

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Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

1 980 000 FEET

285 000 FEET

(Joins sheet 12)

(Joins sheet 16)

(Joins sheet 18)

(Joins sheet 24)

1 995 000 FEET

275 000 FEET

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000

(Joins inset)

2 015 000 FEET

285 000 FEET

2 000 000 FEET

293 000 FEET

290 000 FEET

(Joins sheet 17)

(Joins sheet 12)

275 000 FEET

2 000 000 FEET

1 998 000 FEET

(Joins sheet 25)

(Joins upper left)

2 000 AND 3 000-FOOT GRID TICKS

PRINCE EDWARD COUNTY

NORFOLK AND WESTERN

671

654

Spencer Cr

AlD2 AlB2 AmB2 AmD2 CfB2 CfD2 HfB2 HfC2 IrB2 IrC2 EnB2 EnC2 HfB2 CmB3 CmD3 GuE LuD Wk SrB Wo Ad AbB WmD

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

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CHARLOTTE COUNTY, VIRGINIA NO. 18

CHARLOTTE COUNTY, VIRGINIA NO. 19

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1 891 000 FEET

285 000 FEET

4 000 AND 5 000-FOOT GRID TICKS

(Joins inset A, sheet 1)

(Joins sheet 13)

1 895 000 FEET

275 000 FEET

(Joins upper right)

1 890 000 FEET

270 000 FEET

(Joins inset)

(Joins sheet 20)

(Joins sheet 26)

1 895 000 FEET

265 000 FEET

19

N

1 Mile

5 000 Feet

Scale 1:15 840

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 13)

(Joins sheet 19)

(Joins sheet 21)

(Joins sheet 27)

1 915 000 FEET

270 000 FEET

265 000 FEET

1 900 000 FEET

Camptown

Bethel Church

Mt Carmel Church

Louise

Little Creek

Western Norfolk and

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

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CHARLOTTE COUNTY, VIRGINIA NO. 20

CHARLOTTE COUNTY, VIRGINIA NO. 21

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

(Joins sheet 20)
(Joins sheet 14)
(Joins sheet 22)
(Joins sheet 28)

1 920 000 FEET
1 935 000 FEET
1 270 000 FEET
1 265 000 FEET

Phenix

Temple Branch
Cub Creek
Western Branch
Norfolk and Western
Terrys Creek
Austin Creek
Sandy Creek

21

N

1 Mile
5 000 Feet

Scale 1:15 840

N

1 Mile

5 000 Feet

0

Scale 1:15 840

1 000 ¼ 2 000 ½ 3 000 ¾ 4 000 1 5 000

(Joins sheet 15)

(Joins sheet 21)

(Joins sheet 29)

(Joins sheet 23)

1 955 000 FEET

1 940 000 FEET

270 000 FEET

265 000 FEET

Womacks

Sandy Creek

Roaches Branch

Wards Fork

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 22

CHARLOTTE COUNTY, VIRGINIA NO. 23

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

(Joins sheet 16)
(Joins sheet 22)
(Joins sheet 24)
(Joins sheet 30)

1 960 000 FEET
270 000 FEET
265 000 FEET
1 975 000 FEET

CHARLOTTE COURT HOUSE (county seat)
Central High School
Mt Tirzah Church
Village Church
Randolph-Henry School
Birdsong Creek
Roanoke

N

1 Mile
5 000 Feet
Scale 1:15 840

24

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0 ¼ 1 000 ½ 2 000 ¾ 4 000 1 5 000

(Joins sheet 17)

(Joins sheet 23)

(Joins sheet 25)

(Joins sheet 31)

1 995 000 FEET

270 000 FEET

265 000 FEET

1 980 000 FEET

Roanoke Creek

Spring Creek

Spencer Creek

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 25

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

(Joins sheet 18)
(Joins sheet 24)
(Joins sheet 32)

2 000 000 FEET
270 000 FEET
265 000 FEET
2 015 000 FEET

1 Mile
5 000 Feet
Scale 1:15 840

26

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 19)

1 895 000 FEET

260 000 FEET

250 000 FEET

1 880 000 FEET

(Joins sheet 27)

(Joins sheet 33)

CAMPBELL COUNTY

HALIFAX COUNTY

ROANOKE RIVER

Red Hill

Home of Patrick Henry

Terryville

Spring Hill Church

Turnip Creek

NORFOLK AND WESTERN

Photoinspection from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 26

CHARLOTTE COUNTY, VIRGINIA NO. 27

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0 ¼ 1 000 ½ 2 000 ¾ 3 000 1 4 000 5 000

(Joins sheet 21)

(Joins sheet 27)

(Joins sheet 29)

(Joins sheet 35)

1 935 000 FEET

1 920 000 FEET

260 000 FEET

250 000 FEET

Fears Corner

Harrisburg

Creek

Cub Creek

Wallace Branch

Wallace Branch

Martin Branch

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 28

CHARLOTTE COUNTY, VIRGINIA NO. 29

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

(Joins sheet 28)
(Joins sheet 22)
(Joins sheet 30)
(Joins sheet 36)

1 940 000 FEET
260 000 FEET
1 250 000 FEET
1 955 000 FEET

29
N
1 Mile
5 000 Feet
Scale 1:15 840
1 0 1 000 ¼ 2 000 ½ 3 000 ¾ 4 000 5 000

Fears Corner
Chandlers Forks
Wards Fork
Martin Branch
Chandlers Branch
Fork Creek

30

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0 1/4 1 000 1/2 2 000 3/4 3 000 1 4 000 5 000

(Joins sheet 23)

(Joins sheet 29)

(Joins sheet 37)

(Joins sheet 31)

1 975 000 FEET

260 000 FEET

250 000 FEET

1 960 000 FEET

Roanoke

Bush

Ford

Branch

Creek

Ash

Camp

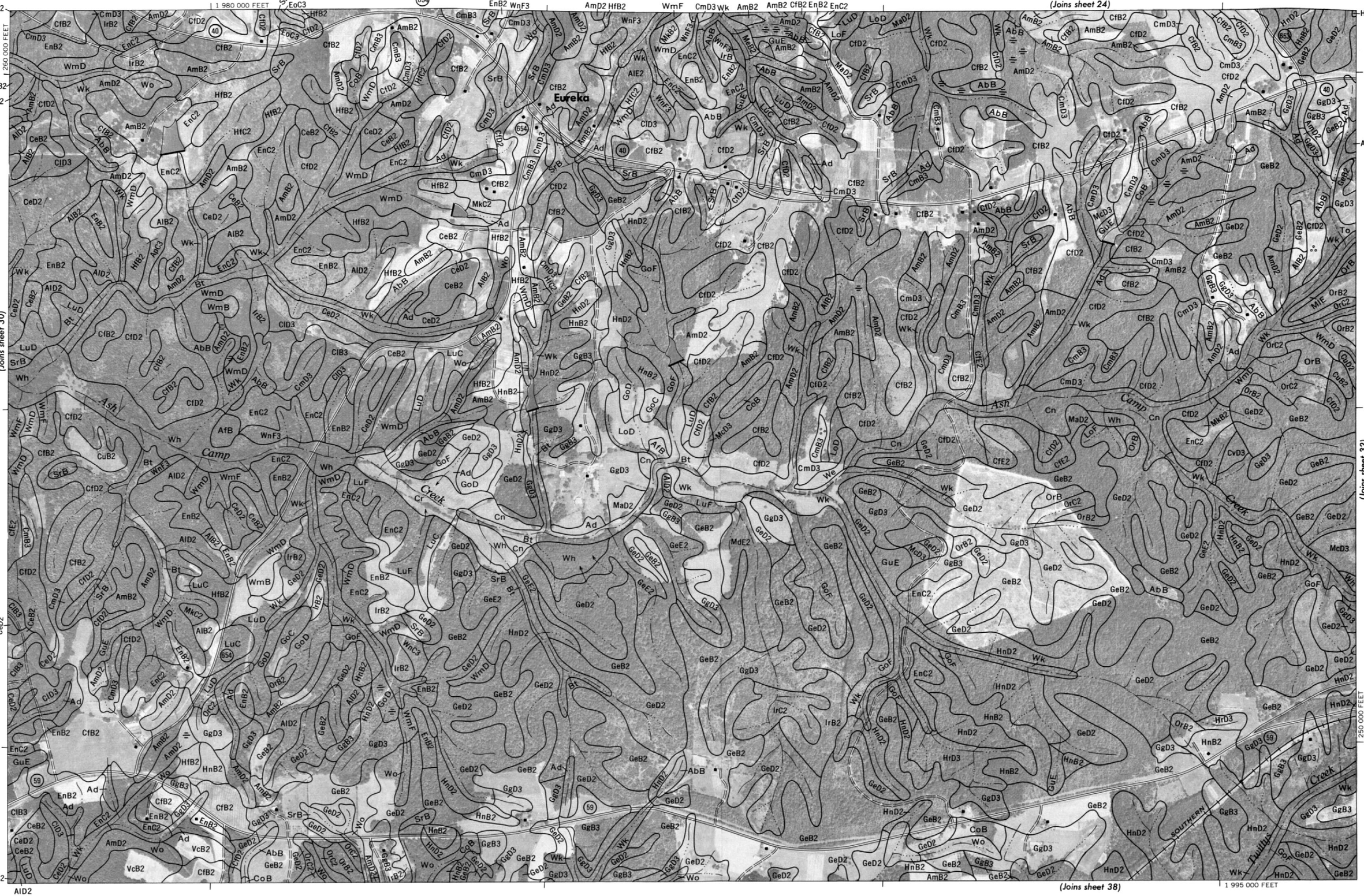
Spencer

Birds

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 30



N

Scale 1:15 840

1 Mile 5 000 Feet

0 0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

2 015 000 FEET

260 000 FEET

250 000 FEET

2 000 000 FEET

(Joins sheet 25)

(Joins sheet 31)

(Joins sheet 39)

KEYSVILLE

Ash Camp Church

Mt Ellis Church

Landing Strip

Camp Creek

Ash Camp Creek

Bentleys Branch

Turkey Egg Creek

SOUTHERN

LUNENBURG COUNTY

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 32

CHARLOTTE COUNTY, VIRGINIA NO. 33

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

1 880 000 FEET

245 000 FEET

(Joins sheet 26)

(Joins sheet 34)

(Joins inset)

1 895 000 FEET

235 000 FEET

N

1 Mile

5 000 Feet

Scale 1:15 840

1 000 AND 4 000-FOOT GRID TICKS

1 883 000 FEET

(Joins below)

235 000 FEET

234 000 FEET

1 887 000 FEET

ROANOKE RIVER

HALIFAX COUNTY

620

619

Cr Ro TuB2 TuF2 TuD2 TvD3 AlB2 LuF LsE3 CeB2 ClD3 MdE2 CeD2 AlD2 Wh Cn VcB2 McD3 ApC3 LoF MaB2 MaD2 LoD GuE AfB Wk Bn WmD TuD2 TuF2 TvD3 MeD2 Bt AuA To

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0 ¼ 1 000 ½ 2 000 ¾ 4 000 1 5 000

(Joins sheet 27)

(Joins sheet 33)

(Joins sheet 35)

(Joins inset, sheet 40)

1 915 000 FEET

245 000 FEET

235 000 FEET

1 900 000 FEET

ROANOKE RIVER

HALIFAX COUNTY

Turnip Creek

Cub Creek

Staunton River Church

Ridgeway Church

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 34

CHARLOTTE COUNTY, VIRGINIA NO. 35

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the virginia coordinate system, south zone.

1 920 000 FEET

245 000 FEET

(Joins sheet 28)

(Joins sheet 34)

(Joins sheet 36)

(Joins sheet 40)

(Joins sheet 40)

1 935 000 FEET

235 000 FEET

HALIFAX COUNTY

ROANOKE RIVER

Cub Creek

Marth Br

Branch

East Wk Branch

Wallace

N

Scale 1:15 840

1 Mile

5 000 Feet

36

N

(Joins sheet 29)

1 955 000 FEET

245 000 FEET

(Joins sheet 35)

(Joins sheet 37)

235 000 FEET

1 940 000 FEET

(Joins sheet 41)

1 Mile
5 000 Feet
Scale 1:15 840

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.
This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 36

CHARLOTTE COUNTY, VIRGINIA NO. 37

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

(Joins sheet 36)
(Joins sheet 30)
(Joins sheet 38)
(Joins sheet 42)

1 960 000 FEET
245 000 FEET
235 000 FEET
1 975 000 FEET

DRAKES BRANCH
Bush Fond Creek
Roanoke
Trulitus
SOUTHERN
St Michaels Church
Organ Hill Church
Substation

N

1 Mile
5 000 Feet
Scale 1:15 840

N

1 Mile

5 000 Feet

0 840

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

1 995 000 FEET

245 000 FEET

235 000 FEET

1 980 000 FEET

(Joins sheet 31)

(Joins sheet 37)

(Joins sheet 39)

(Joins sheet 43)

Twitty's Creek

Bentley's Branch

Reese's Creek

SOUTHERN

623

Phototbase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 38

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

2 000 000 FEET

245 000 FEET

(Joins sheet 32)

(Joins sheet 38)

(Joins sheet 44)

Antioch Church

Walkers Pond

Ontario

Bentleys Branch

SOUTHERN

LUNENBURG COUNTY

Little Jarrior Cr.

2 015 000 FEET

235 000 FEET

39

N

1 Mile

5 000 Feet

Scale 1:15 840

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

(Joins inset)

(Joins sheet 35)

(Joins sheet 34)

(Joins sheet 35)

1 935 000 FEET

1 915 000 FEET

235 000 FEET

230 000 FEET

225 000 FEET

1 920 000 FEET

1 912 000 FEET

(Joins left)

(Joins sheet 41)

(Joins sheet 45)

3 000 AND 5 000-FOOT GRID TICKS

ROANOKE RIVER

HALIFAX COUNTY

Wallace Creek

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

1 940 000 FEET

235 000 FEET

(Joins sheet 36)

(Joins sheet 40)

(Joins sheet 42)

(Joins sheet 46)

955 000 FEET

41

N

1 Mile

5 000 Feet

Scale 1:15 840

1 0 1 000 2 000 3 000 4 000 5 000

¼ ½ ¾

N

1 Mile 5 000 Feet

Scale 1:15 840

0 0 ¼ 1 000 ½ 2 000 ¾ 4 000 1 5 000

(Joins sheet 37)

(Joins sheet 41)

(Joins sheet 47)

(Joins sheet 43)

1 975 000 FEET

235 000 FEET

1 225 000 FEET

1 960 000 FEET

Massingford

Twittys Creek

Gilliam Creek

Southern Branch

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA — SHEET NUMBER 43

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

CHARLOTTE COUNTY, VIRGINIA NO. 43

1 980 000 FEET

235 000 FEET

(Joins sheet 38)

AmB2

GeD2

(Joins sheet 42)

(Joins sheet 44)

(Joins sheet 48)

1 995 000 FEET

225 000 FEET

Reeses Creek

Lickfort Creek

Horsepen Creek

Delaney Creek

43

N

1 Mile

5 000 Feet

Scale 1:15 840

(44)

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 39)

(Joins sheet 43)

(Joins sheet 49)

2 015 000 FEET

235 000 FEET

225 000 FEET

2 000 000 FEET

Walloces Store

RUSSES CREEK

SOUTHERN

LUNENBURG COUNTY

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 44

CHARLOTTE COUNTY, VIRGINIA NO. 45

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

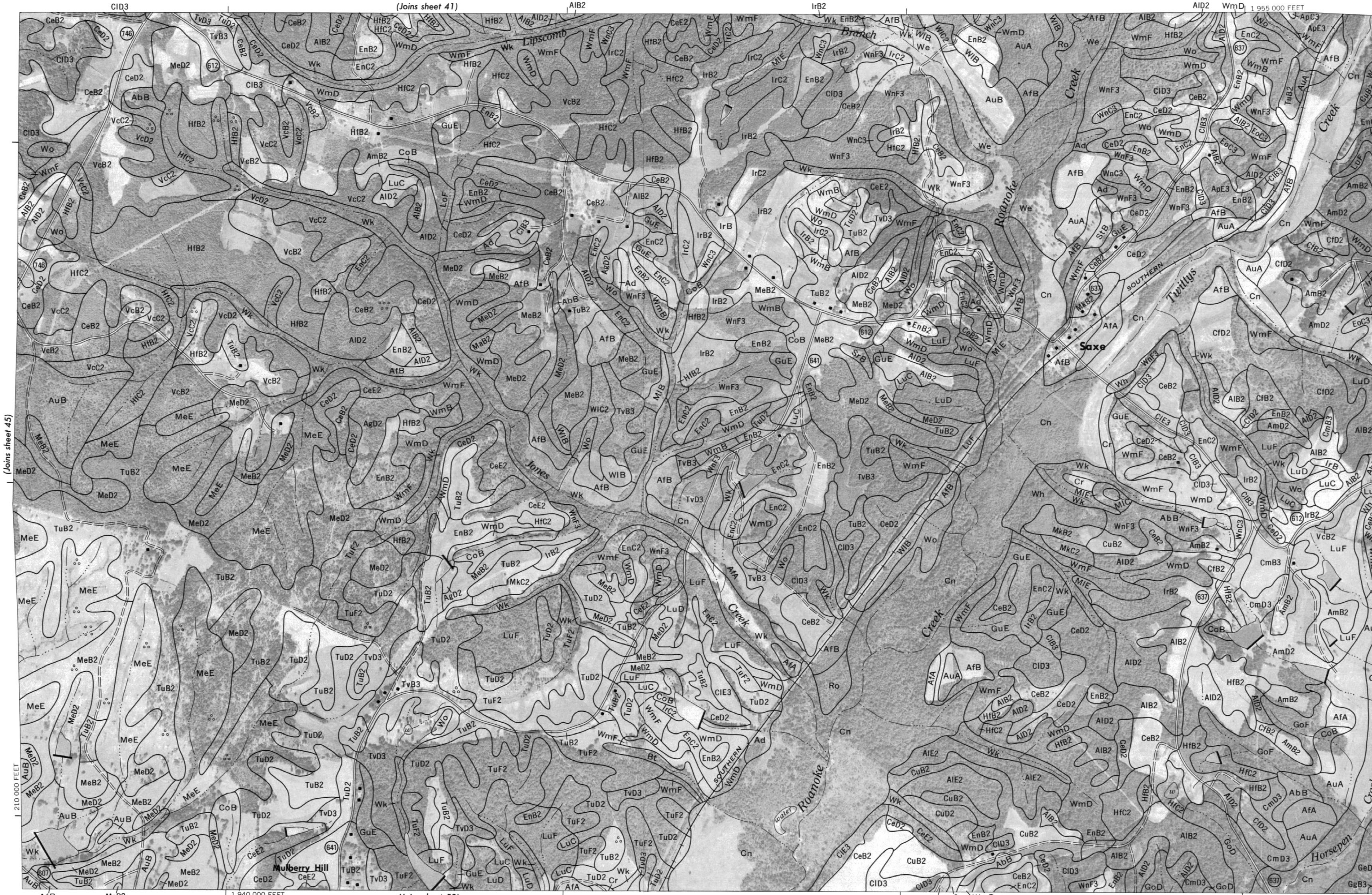
1 920 000 FEET

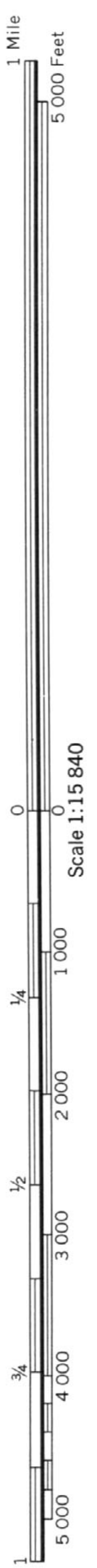
220 000 FEET

2 000 AND 3 000-FOOT GRID TICKS

CHARLOTTE COUNTY, VIRGINIA — SHEET NUMBER 46

N





Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 47

1 960 000 FEET

220 000 FEET

(Joins sheet 46)

(Joins sheet 42)

(Joins sheet 48)

(Joins sheet 51)

1 975 000 FEET

210 000 FEET

47

N

1 Mile

5 000 Feet

Scale 1:15 840

N

Scale 1:15 840

1 Mile

5 000 Feet

1 995 000 FEET

220 000 FEET

210 000 FEET

1 980 000 FEET

(Joins sheet 43)

(Joins sheet 47)

(Joins sheet 49)

(Joins sheet 52)

Horseshoe Lake

Lickfork Creek

Delaney Creek

Horsepen Creek

Lebanon Church

Tabernacle Church

Crafton Gate

Smith Mcmurrin River

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 48

CHARLOTTE COUNTY, VIRGINIA NO. 49

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

2 000 000 FEET

220 000 FEET

(Joins sheet 44)

(Joins sheet 48)

Fort Mitchell

LUNENBURG COUNTY

SOUTHERN

(Joins inset A)

2 005 000 FEET

210 000 FEET

1 998 000 FEET

(Joins lower left)

INSET A

205 000 FEET

South Meherrin River

Blackwater Branch

MECKLENBURG COUNTY

(Joins sheet 52)

(Joins inset B)

2 000 000 FEET

200 000 FEET

2 000 AND 5 000-FOOT GRID TICKS

INSET B

(Joins inset A)
1 998 000 FEET

(Joins sheet 55)
195 000 FEET

MECKLENBURG COUNTY

1 999 000 FEET

194 000 FEET

1 000-FOOT GRID TICKS

49

N

1 Mile

5 000 Feet

Scale 1:15 840

(50)

N

1 Mile 5 000 Feet

Scale 1:15 840

1 | 5 000 | 1/4 | 1 000 | 0

1/2 | 2 000 | 0

3/4 | 3 000

4 000

5 000

1 955 000 FEET

205 000 FEET

200 000 FEET

1 940 000 FEET

(Joins inset, sheet 45)

(Joins sheet 46)

(Joins sheet 51)

(Joins sheet 53)

Mulberry Hill

Randolph

Horsepen Creek

Reynolds Creek

Millpond Branch

Piney Grove Church

Formosa

ROANOKE RIVER

SOUTHERN RY

HALIFAX COUNTY

AuA AuB AbB AfA AfB AgB2 AgD2 AlB2 ApE3 ApC3 AmD2 BtB CaB2 CcB2 CeB2 CeD2 CeE2 ClD3 ClE3 CmD3 CnB2 CoB CrB2 CfB2 CfD2 CfE2 CvB3 EnB2 EnC2 GeB2 GeD2 GeE2 GgB3 GgD3 GoB GoC GoD GoF GuE HfB2 HfC2 HnB2 HnD2 HrB3 HrD3 IrB2 LuC LuD LuF MeB2 MeD2 MeE OrB2 OrC2 RoB StB TuB2 TuD2 TuF2 TvB3 TvD3 WhB2 WkB2 WmB WmC3 WmD WmF WnF3 WoB2

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 50

CHARLOTTE COUNTY, VIRGINIA NO. 51

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

(Joins sheet 50)
(Joins sheet 47)
(Joins sheet 52)
(Joins sheet 54)

1 960 000 FEET
205 000 FEET
200 000 FEET
1 975 000 FEET

Cedar Grove Church
Reynolds Cn
Jumpin Branch
Little Horsepen Creek
Reynolds Creek

51

N

1 Mile
5 000 Feet

Scale 1:15 840

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0 ¼ 1 000 ½ 2 000 ¾ 3 000 1 4 000 5 000

1 995 000 FEET

205 000 FEET

200 000 FEET

1 980 000 FEET

(Joins sheet 48)

(Joins sheet 51)

(Joins sheet 55)

(Joins inset, sheet 49)

Horsepen Creek

Little Creek

Bluestone Creek

Langford Pond

Bacon District School

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 52

CHARLOTTE COUNTY, VIRGINIA NO. 53

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

1 940 000 FEET

195 000 FEET

185 000 FEET

1 955 000 FEET

ROANOKE RIVER

HALIFAX COUNTY

Sandy Creek

(Joins sheet 50)

(Joins sheet 54)

(Joins sheet 56)

53

N

1 Mile

5 000 Feet

Scale 1:15 840

N

1 Mile

5 000 Feet

Scale 1:15 840

1 975 000 FEET

1 960 000 FEET

195 000 FEET

185 000 FEET

(Joins sheet 51)

(Joins sheet 53)

(Joins sheet 55)

(Joins sheet 57)

Hebron Church

Rocky Branch Church

Wylliesburg

Berlos Creek

Sandy Creek

Little Marley Creek

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 54

CHARLOTTE COUNTY, VIRGINIA NO. 55

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

(Joins sheet 52)
(Joins sheet 54)
(Joins sheet 58)
(Inset B, sheet 49)

1 980 000 FEET
1 995 000 FEET
195 000 FEET
185 000 FEET

Bluestone Creek
Devils Branch
Moody Creek
MECKLENBURG COUNTY

55
N
1 Mile
5 000 Feet
Scale 1:15 840
0 1/4 1/2 3/4 1
1 000 2 000 3 000 4 000 5 000

CHARLOTTE COUNTY, VIRGINIA — SHEET NUMBER 56

N

1 Mile 5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 56

1 960 000 FEET

1 980 000 FEET

(Joins sheet 54)

(Joins sheet 56)

(Joins sheet 58)

(Joins sheet 60)

1 975 000 FEET

170 000 FEET

Public Fork

Kings Crossroads

Barnes Junction

Spring Branch

Buffalo Creek

Bruce Branch

Tamahrd Branch

Bluestone Creek

Scale 1:15 840

1 Mile

5 000 Feet

N

57

N

Scale 1:15 840

1 Mile 5 000 Feet

0 0 ¼ 1 000 ½ 2 000 ¾ 3 000 1 4 000 5 000

(Joins sheet 55)

(Joins sheet 57)

(Joins inset)

(Joins lower left)

(Joins sheet 60)

1 995 000 FEET

1 980 000 FEET

1 978 000 FEET

180 000 FEET

169 000 FEET

167 000 FEET

170 000 FEET

2 000-FOOT GRID TICKS

Creek

Moody

Little Moody Cr

Bluestone

Otter Creek

COUNTY

MECKLENBURG

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.

CHARLOTTE COUNTY, VIRGINIA NO. 58

CHARLOTTE COUNTY, VIRGINIA NO. 59

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, the Virginia Polytechnic Institute, and State University.
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Virginia coordinate system, south zone

1 940 000 FEET

170 000 FEET

(Joins sheet 56)

ROANOKE RIVER

HALIFAX COUNTY

(Joins sheet 60)

(Joins sheet 61)

1 955 000 FEET

160 000 FEET

N

1 Mile

5 000 Feet

Scale 1:15 840

1 0 1 000 2 000 3 000 4 000 5 000

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 57) VaB2 AgD2

(Joins sheet 58)

(Joins sheet 59)

(Joins sheet 62) HnB2 CoB HnB2

1 975 000 FEET

170 000 FEET

160 000 FEET

1 960 000 FEET

Red Oak

Antioch Church

Salem Church

MECKLENBURG COUNTY

Buffalo Creek

Bruce Spring Br

Bluestone Creek

Cargills Creek

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CHARLOTTE COUNTY, VIRGINIA NO. 60

CHARLOTTE COUNTY, VIRGINIA — SHEET NUMBER 61

61

N

1 940 000 FEET

155 000 FEET

(Joins sheet 59)

(Joins sheet 62)

(Joins sheet 63)

1 955 000 FEET

145 000 FEET

ROANOKE RIVER

HALIFAX COUNTY

Creek

Cargills Wk

1 Mile

5 000 Feet

Scale 1:15 840

0 1 000 2 000 3 000 4 000 5 000

CHARLOTTE COUNTY, VIRGINIA NO. 61

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N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

1 975 000 FEET

1 155 000 FEET

145 000 FEET

1 960 000 FEET

(Joins sheet 60)

(Joins sheet 61)

(Joins inset, sheet 63)

Cargills Cr

Cr Creek

Bluestone

COUNTY

MECKLENBURG

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CHARLOTTE COUNTY, VIRGINIA NO. 63

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1 940 000 FEET

140 000 FEET

135 000 FEET

1 963 000 FEET

3 000 AND 5 000-FOOT GRID TICKS

(Joins sheet 62)

1 960 000 FEET

(Joins right)

(Joins sheet 61)

1 955 000 FEET

(Joins inset)

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000